B 615886
OCT 13 1956

OCTOBER, 1956

WOOD WORKING Digest

A HITCHCOCK PUBLICATION

Safety Committees At Work

THE LIBRARY OF CONGRESS
OCT 23 1956

SPOTNAILERS

reduce cost of nailing webbing by at least 50%

No longer is the secure fastening of sofa and chair webbing a costly hand operation. Air drive Spotnailers will more than double normal output with the same number of man hours—even with inexperienced operators.

A ¾" leg, 16 gauge, heavy duty Spotstaple has proved to have more than enough holding power. The webbing can be nailed and indented to the hardest wood frames, firing three shots per second.

Your local Spotnail man will demonstrate this profit-making tool in your own plant. He will also help you with many other nailing problems.

Call him today!

Spotnailers are available in both mallet drive and air drive models for driving staples from ⅜" to 1½".

See Action Card, page 160. Circle No. 423

SPOTNAILS, INC.

EVANSTON 1, ILLINOI

B : 615886 OCT 15 1956 B : 615886

OLIVERS cut accurate clean mortises . . . *fast!*

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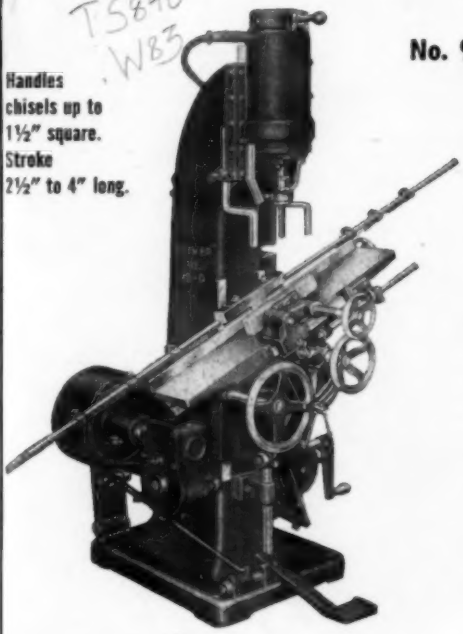
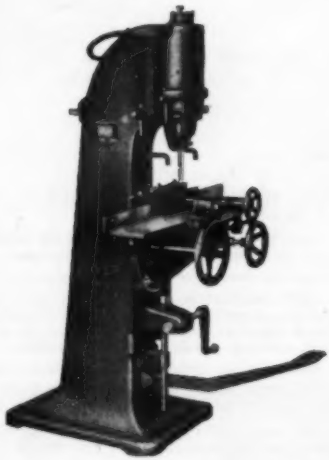
.W83



Handles chisels up to 1½" square. Stroke 2½" to 4" long.

No. 92D Power Feed Mortiser gives most production for your dollar

This Hollow-Chisel Mortiser has earned its popularity with high production. Has new head with fan integral with motor to keep work clean. Cuts clean mortises at 16 to 40 strokes a minute. Adjustable swing type clamp. The universal compound table has vertical, horizontal and angular adjustments. Operators find it easy to set and run. Write for Bulletin No. 92D.



Oliver No. 91D Mortiser

Here's a powerful, smooth-operating Mortiser. Takes chisels ¼" to ¾" square—stroke 2½" to 4". With a 5 h-p. motor it handles chisels 1½" square. Universal compound table tilts 45° to right or left. Blower keeps work clean. Write for Bulletin No. 91D.

No. 194D Mortiser takes chisels ½" square, stroke 4". Unusual capacity. Has many refinements and features of larger Oliver Mortisers. Write for Bulletin No. 194D today.

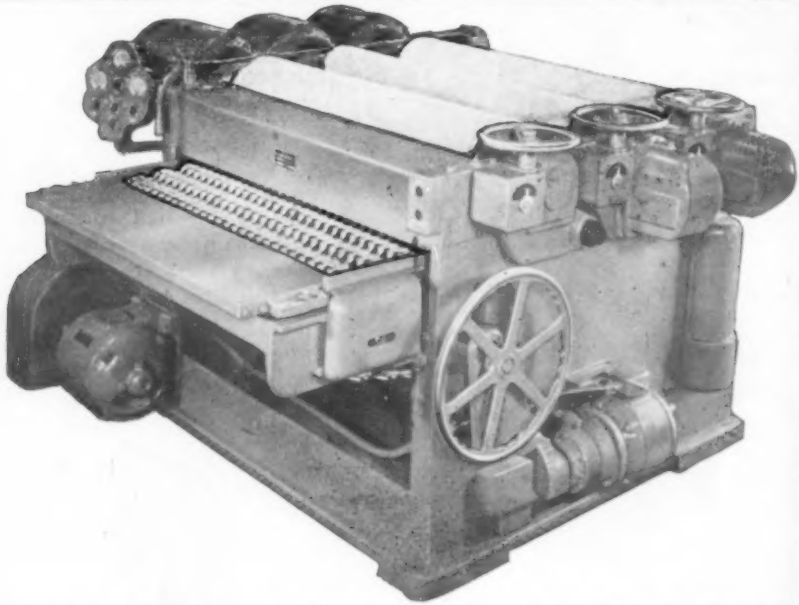
OLIVER MACHINERY COMPANY

Established 1890 **GRAND RAPIDS 2, MICHIGAN**

See Action Card, page 160. Circle No. 201

COPIED — BUT NEVER EQUALLED

THE SMITH ENDLESS BED DRUM SANDER



Since 1832, **H. B. Smith Machine Co.** has been traditionally **First in Progress, First in Quality, First in Service.**

Since 1896, the year **H. B. Smith Machine Co. introduced** the first Endless Bed Drum Sander to the world of wood working, Engineering Development and Research has constantly progressed.

Self oscillating drum mechanism—Simple, positive bed adjustments—Simple, positive drum adjustments—Handy location of all hand wheels—Sanding thickness to close tolerances, resulting in high quality sanding and production.

These and many other **exclusive** features are built into **Smith 2, 3, and 4 Drum Endless Bed Sanders.** You should investigate.

Just write and say "I want more information about the **Smith Endless Bed Drum Sanders** and tell me about your **lease plan** also".

WOOD WORKING MACHINERY · WMMA · MANUFACTURERS ASSOCIATION

H. B. SMITH MACHINE CO.

SMITHVILLE

BURLINGTON COUNTY **NEW JERSEY**

See Action Card, page 160. Circle No. 202

It Will Pay You To CHECK These Facts!

Here's What

WILLIAM'S "NO-NIFE" HOGS

✓ Can Do For You:

1. Increase The Heating Value Of Your Wood Scrap!

When reduced to chip form by hogging, wood burns more evenly—gets *all* the heat value possible. Unhogged slabs, trimmings, large pieces, restrict air flow, smother fire, result in inefficient combustion.

2. Improve Quality Of Wood Flour And Sawdust!

Processing wood scrap with a Williams Hog, for resale in the form of wood flour or sawdust, assures more uniform grinding and sizing—much lower labor costs—reduced power requirements.

3. Reduce Handling Cost As Much As 75%!

One man firing wood in chips can handle the same tonnage as would require three men if fuel scrap remained in awkward lengths and pieces that necessitate individual handling.

4. Your Operation May Permit Complete Automatic Handling

Williams has made many automatic installations to hog and convey waste wood to stoker or boiler at tremendous savings in handling expense. Other installations to automatically grind, separate and package wood flour and sawdust result in phenomenal reductions in cost.

Williams equipment will actually pay for itself in a few months, then continue to produce extra profits for many years. Investigate now!

Write for Details

WILLIAMS BUILDS A COMPLETE LINE • Hogging, Grinding & Shredding Machines • Vibrating Screens • Conveying Systems • Air & Mechanical Separators • Complete "Packaged" Plants • Cyclone Collectors

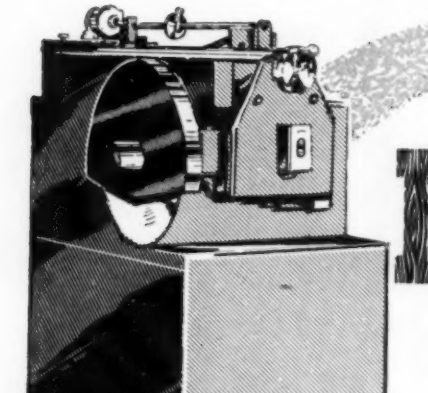
WILLIAMS PATENT CRUSHER & PULVERIZER CO. • 808 ST. LOUIS AVE., ST. LOUIS 6, MO.

WILLIAMS

CRUSHERS GRINDERS SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

See Action Card, page 160. Circle No. 203



SPECIFY

BEACH

the only
all electric automatic

STRAIGHT LINE CUT-OFF SAW*

TILTING TABLE SAW

DOUBLE CUT-OFF SAW

SHAPER

The safest automatic feed ever offered—all electric—no air or hydraulics used! New mounting principle assures straight line action throughout the stroke—on lightest or heaviest work.

Only Beach offers all these features in a Straight Line Cut-Off Saw*:

- **adjustable pushing power on the stroke**
- **foot pedal control for single or continuous operation**
- **selective forward feeding speeds with quick return**
- **quick adjustable stop for length of stroke**
- **hand or power operated without adjustments**
- **sealed ball bearings—no oiling or greasing**
- **built-in saw guards; enclosed ram**

Standard 5 HP motor with ½ HP feed motor. Standard machine with 20" stroke; others to order.

Write today—

for full details on Beach all electric Straight Line Cut-Off Saws and the complete line of Beach woodworking machinery.

*Patent applied for

BEACH
MANUFACTURING CO.
MONTROSE, PA.

See Action Card, page 160. Circle No. 204

MEMBER BPA

OCTOBER, 1956

Vol. 58 No. 10

Published Monthly

WOOD WORKING Digest

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Are Listed on page 120

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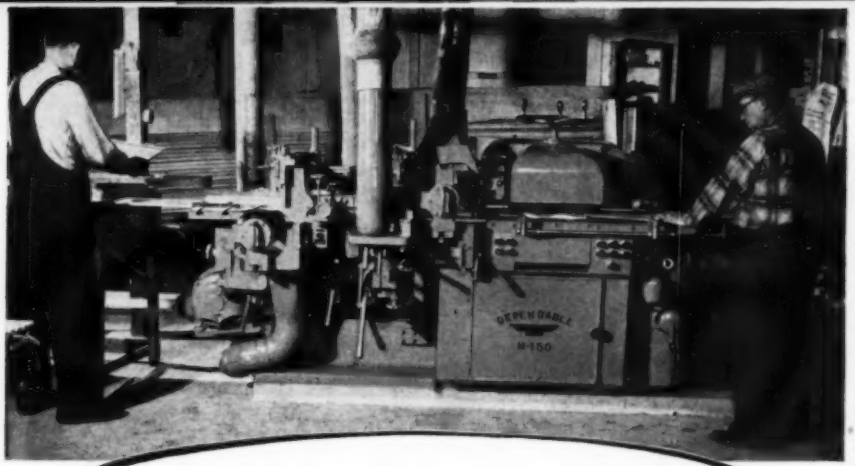


This Dependable Moulder Gives the Westbrook Company FASTER SET-UPS, HIGHER PRODUCTION

Westbrook Company, Greensboro, N.C., manufactures highest quality mouldings — picture frame, furniture dimension and core stock. Here is what they say about their Dependable Moulder. "Our Dependable Moulder is easier to set up than any moulder we have ever seen. Because it gives us easier, faster set-ups, on the average we get an extra production hour daily.

"Something even more important to us is the high quality work the Dependable Moulder produces. In running mostly hardwoods, our work has to be very exact. Drawer sides and other furniture stock has to be held to close tolerances. Picture frame mouldings and other work must have a very smooth finish. The variable feed of our moulder enables us to get the exact quality of finish we want. We would never buy another moulder without a variable feed.

"Another thing we like about the Dependable Moulder is the high spindle speeds without frequency changer. This saves us money. Even on deep, heavy cuts we get the same power out of Dependable's belt drive that you normally get from a direct drive machine.

"We are very pleased with our Dependable Moulder."

You too can get *greater production*, *better quality* and *lower operating costs* with a Dependable Moulder.

Write today for Bulletin C-12-B and name of nearest dealer.

Dependable Also Builds

- Gang Rip Saws
- Knife Jointers
- Knife Grinders
- Knife Balancers
- Head Grinders
- Saw Grinders
- Blower Fans
- Moulders
- Cutter Heads
- Shapers

Dependable

MACHINE COMPANY, INC.

GREENSBORO, NORTH CAROLINA, U.S.A.

Openings For Reliable Dealers In Certain Areas of U.S.A. and Canada

See Action Card, page 160. Circle No. 205

High Production Glue Spreaders

RESILIENT ROLL BALL BEARING GLUE SPREADER

✻ **BLACK BROTHERS have built more resilient roll glue spreaders during the past fifteen years than all other manufacturers.**

Unmatched in speed, economy, accuracy, cleanliness and quality production . . . the No. 22D Ball Bearing, Resilient Roll Spreader is by far the finest glue spreader available for resins, caseins, and other cold glues. Gluing rolls are deeply covered with the fine synthetic rubber, and are specially grooved to control the amount of glue deposited and to conform to irregularities in the stock. Water cooled doctor rolls are available for use with quick setting glues. Accurate, heavy duty ball bearings are sealed to keep lubricants in, and dirt and glue out. Doctor rolls are heavily *coated* with a highly polished, nonferrous surface to accurately control the glue spread. Investigate the 22D Spreader today . . . write for supplement to Bulletin 11-A.

"If It Is Gluing Equipment — We Have It"

THE BLACK BROTHERS CO., INC.

MENDOTA, ILLINOIS, U. S. A.

See Action Card, page 160. Circle No. 206

WOOD-LOK®

Does two jobs at Oxford Cabinet Co.

FROM THE ROUGH LOG TO FINAL FINISH—Oxford Cabinet Company, Oxford, Pa., harvests its own timber lands. Saws into lumber. Assembles. Does everything—in combining the beauty of Birch and Sound Knotty Pine with utility and compactness for today's streamlined kitchens.

Oxford's assembly work and laminating are faster. Stronger. Why? Because of the setting speed, strength and convenience of WOOD-LOK, National's cold run, ready-for-use resin glue.

WOOD-LOK may well modernize your operations, too. One of National's sales technicians will be glad to show you how. Just write. Or telephone your nearest National office.

RESYNS®
National
ADHESIVES

NATIONAL ADHESIVES • Woodworking Department WD (Resin Division), 270 Madison Ave., New York 16
3641 So. Washtenaw Ave., Chicago 32 • 735 Battery St., San Francisco 11 • 1511-23 So. Main St., High Point, N. C.

SIMPLIFIES ASSEMBLY

AUTOMATIC DOWELLING

WOOD-LOK is applied with automatic glue gun for dowels on hard rock maple assembly. Dowel joints are stronger than those obtained with any other type adhesive.

NO CHILLED JOINTS

WOOD-LOK allows 5-7 minutes open assembly time. This time interval is more than enough for precision alignment in edge gluing extra long stock.

STRONGER GLUE BLOCKING

WOOD-LOK bonded blocks hold face frame to sides of cabinet. No nails or screws are used. Superior tensile strength of glue line insures durable construction.

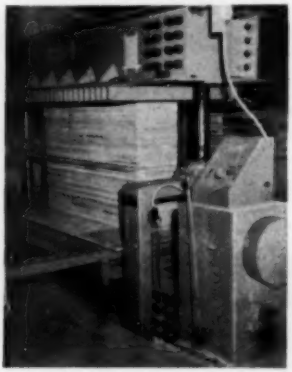
SPEEDS LAMINATING

SIMPLIFIED GLUING

WOOD-LOK requires no mixing. It's virtually odorless. Nonirritating to skin. Lasts all day in the pot. Moreover, it cleans up readily with water.

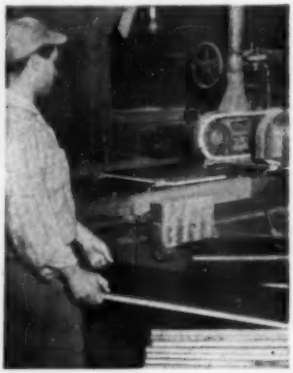
NO I-BEAMS OR CLAMPS

WOOD-LOK needs only a 15-30 minute press. No I-Beams, clamps or curing rooms are necessary. Assembly time: up to 45 minutes without danger of precure.



FASTER MACHINING

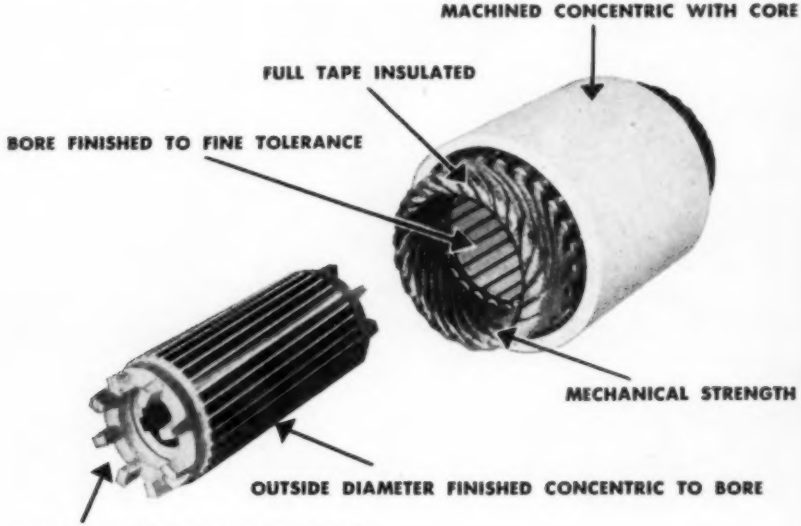
WOOD-LOK laminated doors can be trimmed one hour after pressing. Glue line is practically nonabrasive. Saves cost of frequent blade resharpening.



See Action Card, page 160. Circle No. 207

Serving the Industry Since 1852

WOODS SHAFTLESS MOTORS


MACHINED CONCENTRIC WITH CORE
FULL TAPE INSULATED
BORE FINISHED TO FINE TOLERANCE
MECHANICAL STRENGTH
OUTSIDE DIAMETER FINISHED CONCENTRIC TO BORE
VANES CAST INTEGRAL WITH ROTOR

The application of direct motor drive with WOODS' Shaftless Motors to high-speed spindles brings the peak of motive efficiency at relatively small cost. Conserves space—eliminates belts and gears—fewer wearing parts. The extensive and varied lines of WOODS' Shaftless Motors are available for nearly every class of direct application.

Let us tell you how you can achieve a reduction in production costs by direct motor drive.

MOTOR DIVISION

S. A. WOODS MACHINE CO.

27 DAMRELL STREET

BOSTON 27, MASS.

Branch Office: N.C., Greensboro

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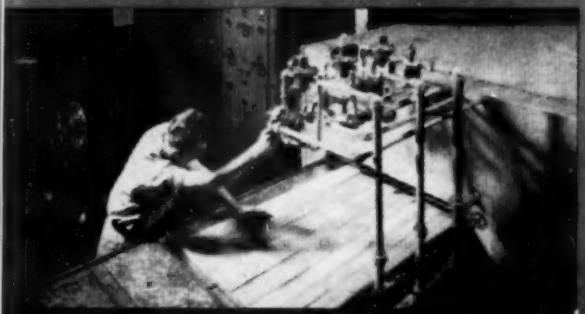
CATALIN

offers a complete range of UREA, PHENOLIC, RESORCINOL ADHESIVES and necessary ACCELERATORS



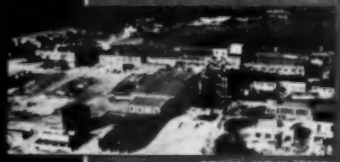
The initial quality of a glue joint and its durability under expected service conditions are important considerations when selecting a wood adhesive! Too, the right bond must also incorporate fast cures, easy clean-up and be adaptable to existing production equipment. Last but by no means least, the adhesive must also be low in cost!

Catalin, with the longest record of achievement in the development of resins for the woodworking industry, offers a complete standard line of ACCELERATORS for use with the Company's full range of ADHESIVES (urea, phenolic and resorcinol). Together, these readily blended, fast curing resins answer most plant production techniques and product specifications for hot and cold press, long assembly time operations and RF heating. Special formulations to meet individual requirements are also available.

Whether standard or specially formulated, these quality-products are gilt-edge bonds—the entire industry places a high, above par value upon their resistance to water, fungus and crazing . . . and their ability to serve both civilian and military applications.

Catalin welcomes the opportunity to suggest and submit new, improved formulations for your particular wood production problem. Inquiries invited!

FOR FAST DELIVERIES *Catalin maintains three strategically located resin plants . . .*



at FORDS, NEW JERSEY

THOMASVILLE, NORTH CAROLINA

and CALUMET CITY, ILLINOIS

CATALIN CORPORATION OF AMERICA
ONE PARK AVENUE, NEW YORK, N. Y.

Catalin

branch offices:
CHICAGO, ILL., 221 No. LaSalle Street
GREENSBORO, N. C., 630 Southeastern Bldg.

See Action Card, page 160. Circle No. 209

Furniture and Shutter Manufacturers!

. . . purchase your quality hardware from 1 dependable source . . . from

NATIONAL LOCK

National Lock functional and decorative hardware is pleasingly styled and quality made to enhance the user appeal of your products. Write us for information on how this one-source supplier can save purchasing and inventory headaches right down your production line.

NATIONAL LOCK COMPANY

Rockford, Illinois Industrial Hardware Division

See Action Card, page 160. Circle No. 210

Nothing Compares with the WHITNEY 97 DOUBLE SURFACER

For quality production and low cost planing

Whitney 97 Double Surfacer
Feeds: 30 to 90 feet per minute
Planes stock ⅛" to 7" thick
Widths, 30" 36" 40" and 44"

The Whitney 97 Double Surfacer, the last word in modern planer design, is built to handle your double surfacing requirements. Its rugged proportions and faster feeds permit it to handle easily the volume production required in today's modern plant. Traditional Whitney accuracy and careful workmanship assure smooth, accurate planing, continuous production, low cost maintenance and the stamina to produce best results under the severest kind of service.

The Whitney 97 will bring to your plant a new conception of production efficiency and cost savings. High production quotas will be maintained and sanding and finishing costs substantially reduced. Investigate today the Whitney 97 for your double surfacing requirements. Write for full particulars. Ask for planer bulletin **D 1.**

Check these features

- Wedge Construction
- Nitralloy Center Table
- Ball and Roller Bearings thruout
- Motor Raising and Lowering of Bed
- Built-in Variable Speed Feed
- Micro-feed Selector
- Automatic Power Feed Grinder

In our 117th year

Baxter D. Whitney & Son, Inc.
WINCHENDON, MASSACHUSETTS, U. S. A.
Quality Built Woodworking Machinery Since 1837

Planer Specialists
FOR MORE THAN 100 YEARS

PLANERS • SHAPERS • AUTOMATICS • VARIETY SAWS • BACK KNIFE LATHES

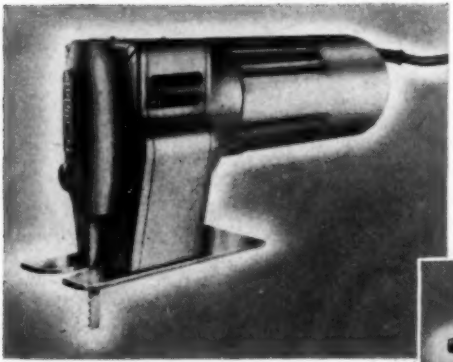
See Action Card, page 160. Circle No. 211

Lesto ELECTRIC HAND TOOLS

AS PRECISION-MADE . . . AS A SWISS TIME-PIECE

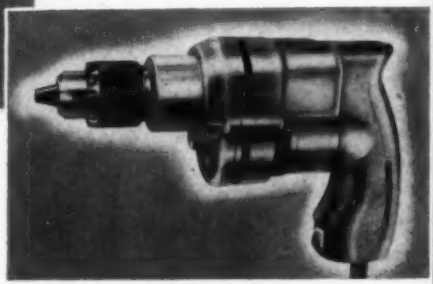
TOOLS THAT REDUCE WORKER FATIGUE, this dependable line of LESTO Swiss precision-made portable electric power tools fills every professional need. Built to satisfy the most critical worker, LESTO electric tools are rugged, versatile, durable. Superior in performance, they outlast, outperform the average power tool . . . there's less worry about mechanical breakdown. When you hold one of these Swiss electric tools in your hand . . . see how it performs; you'll thrill to its power . . . you'll know it's a tool you can depend on for year-round working pleasure.

SWISS QUALITY—known around the world for precision workmanship . . . dependable, long-lasting performance.



LESTO ELECTRIC HAND SAW

All purpose—use as a rip, crosscut, coping, keyhole, band, scroll or jig saw. Twenty different blades to choose from for almost every type of specialized job. It's fast in action, light in weight. Effortless, accurate, rapid cutting. Fine cut eliminates sanding. Makes inside holes without first drilling a starting hole. Moving parts are equipped with 8 ball and roller bearings to reduce friction, increase machine life—assuring the finest balance, least vibration. Three models for cutting curves and fancy shapes in hard and soft wood, formica, pressboard, plastic, metal, abrasive materials, etc.



LESTO ELECTRIC HAND DRILL

For assembly line production, used for wood and metal working. Compact lightweight drill, easy to handle for the mechanic in the field. Equipped with ball bearings.

For further details write for literature.

SERVICE AND PARTS AVAILABLE FROM COAST TO COAST

VICTOR J. KRIEG, Inc.

PRECISION-MADE POWER TOOLS FOR UNSURPASSED PERFORMANCE

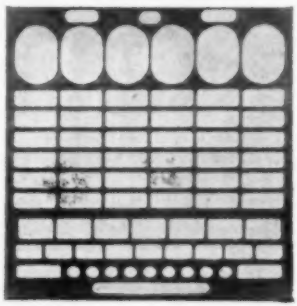
611 BROADWAY, NEW YORK 12, NEW YORK

See Action Card, page 160. Circle No. 212

Onsrud HIGH SPEED ROUTERS

1

2

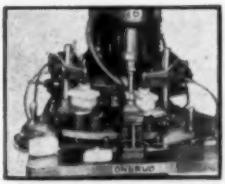


3

1 Work sample in oak, showing range of routing cuts made with Onsrud W-244E Router at 20,000 RPM.

2 Cutout work in ¾" plywood. Routing operations totaled 367 lineal inches. Production time 1½ to 2½ minutes per part, depending upon operator.

3 Typical shaped parts, produced by Onsrud Router equipped with high speed S-9 Shaping Attachment.



Make Your Router a Shaper ... with an Onsrud S-9 Shaping Attachment for work up to 9" diameter. Lets you rout and shape on one machine.

for LOW COST, ACCURATE ROUTING

of every type of part

• Whatever your production need, there's an Onsrud Router to give you accurate, high speed production. Built in eleven types and capacities as fixed arm, radial arm and portable units. Shown here are a few of the many types of operations where Onsrud Routers can save you money. Modern design provides maximum safety, speed and ease of operation. For complete information write for bulletin—"Onsrud Routers."

ONSRUD MACHINE WORKS, Inc.

Woodworking Division

3947 Palmer Street • Chicago 47, Illinois

See Action Card, page 160. Circle No. 213

*among men who know glues**

Crawford Furniture Company

Laminite Plastics Corporation

Manufacturers of fine furniture—such as that produced by Crawford Furniture Company, Jamestown, N. Y.—know how important glues are to the finished product.

Jacob (Jake to his many friends) Johnson, manager of Crawford's Jamestown plant, and assistant to Crawford president, Clyne Crawford at New Bethlehem, considers adhesive specification and purchase a matter of top echelon consideration. He demands the right glue for every adhesive job . . . and he knows from long and practical experience what to look for in both type of adhesive and method of application for best results.

"Jake" Johnson has been with Crawford since 1944. He points with pride to a family comprising two sons (both furniture industry executives) three daughters—and eight grandchildren.

He is an amateur horticulturist—and loves boating and fishing—when time permits him to indulge.

LAMINITE PLASTICS is one of the pioneers in large-quantity, top-quality plastic table top manufacturing . . . and Art Pais has been in on Laminite's development from the start. In fact, his associates tell us that he has had a hand in every operation from ordering raw materials to selling his company's finished product. Being the kind of genius who can improvise a machine with a wrench and a handful of bolts, Art Pais is largely responsible for developing many new automatic processes which are now used throughout the plastic top industry.

Friendly as a hound-dog pup at mealtime, Art Pais is well spoken of by everybody—including his competitors.

Married, and the father of two boys and a girl, Mr. Pais reports Hi-Fi as his hobby... and home the place not to run away from—except to the business of laminating table tops which Laminite does a lot of, with the aid of National Casein glues.

Do you realize just how many really vital glue jobs there are—from laminating intricate panels for fine musical instruments to giant trusses to support a roof? Is it any wonder that we of National Casein take so seriously this job of delivering the right glue for your job—where you want it, when you want it, and how you want it—tank car, tank truck, drum or bag!

Purpose of our series on **"Men Who Know Glues"** *is to stimulate our own and your thinking on the subject of glues as well as to remind you that you'll stick with National Casein glues—because they stick for you.*

National Casein

601 West 80th Street, Chicago 20, Illinois • Broad and Fulton Streets, Riverton, New Jersey

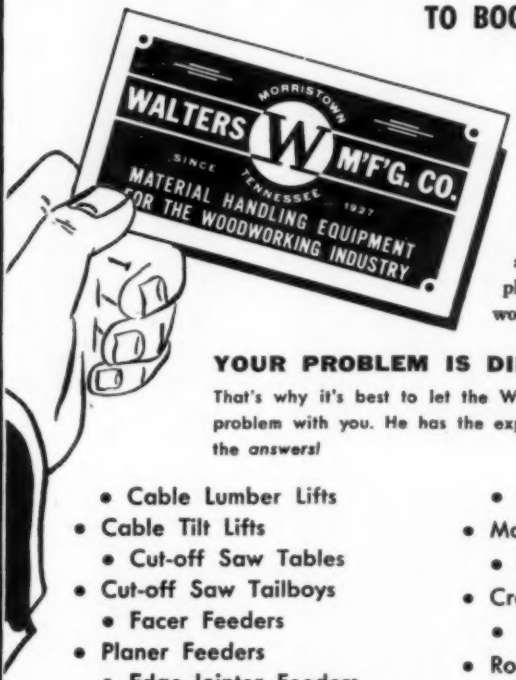
See Action Card, page 160. Circle No. 214

THE MAN WITH THE ANSWERS.

FOR YOUR AUTOMATION AND MATERIALS HANDLING

TO BOOST PRODUCTION . . .

CUT LABOR COSTS!



Walters Automatic Material—Flow Systems replace expensive labor with precision machinery . . . costs drop fast! Walters offers top engineering and plant layout "know-how", plus over 28 years EXCLUSIVE woodworking experience.

YOUR PROBLEM IS DIFFERENT

That's why it's best to let the Walters representative study your problem with you. He has the experience, the facilities . . . and the *answers!*

- Cable Lumber Lifts
- Cable Tilt Lifts
- Cut-off Saw Tables
- Cut-off Saw Tailboys
- Facer Feeders
- Planer Feeders
- Edge-Jointer Feeders
- Edge-Jointer Return Feeders
- Cross-belt Conveyors
- Rip-saw Conveyors
- Sorting Conveyors
- Powered Roller Conveyors
- Floor-to-floor Lifts and Conveyors
- Waste Conveyors
- Moulder Stock Returns
- Slat Conveyors
- Cross-chain Conveyors
- Rip-Saw Tailboys
- Rotary Turntables
- Hot-plate Press Loaders
- Automatic Chopping Saws
- Panel Sizing Saws
- Lumber Yard Transfers
- Dead Roll Conveyors
- Powered Curves—Roller and Chain

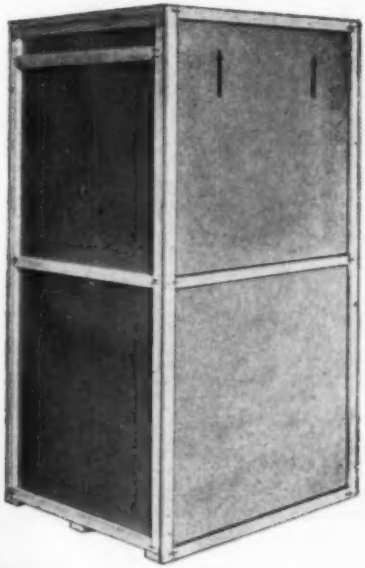
SPECIAL HANDLING EQUIPMENT—ENGINEERED TO YOUR SPECIFICATIONS

WALTERS W MFG. CO. SINCE 1927 — P.O. BOX 498 PHONE 2203 — MORRISTOWN, TENN.

See Action Card, page 160. Circle No. 215

Saranac STAPLED Packages

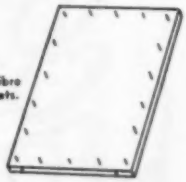
REDUCE DAMAGE IN TRANSIT



Plywood, corrugated fibre or solid fibre packages built with Saranac Machines are stronger . . . afford better protection . . . because they're stapled.

When it comes to stubborn holding ability, a clinched staple just can't be beat! The double penetration and double clinching of the twin legged staple means double security. The staple's crown holds even very thin slats without pulling through. This permits use of lighter stock without sacrificing strength and with consequent savings in both material and shipping costs.

Broad staple crown holds better.



Fastens corrugated fibre board to cleats.

Forms rigid butt joints.

Secures fibre or plywood panels to cleats.

Write for free Bulletin 167-UC. It contains more complete information about Saranac stapling machines.

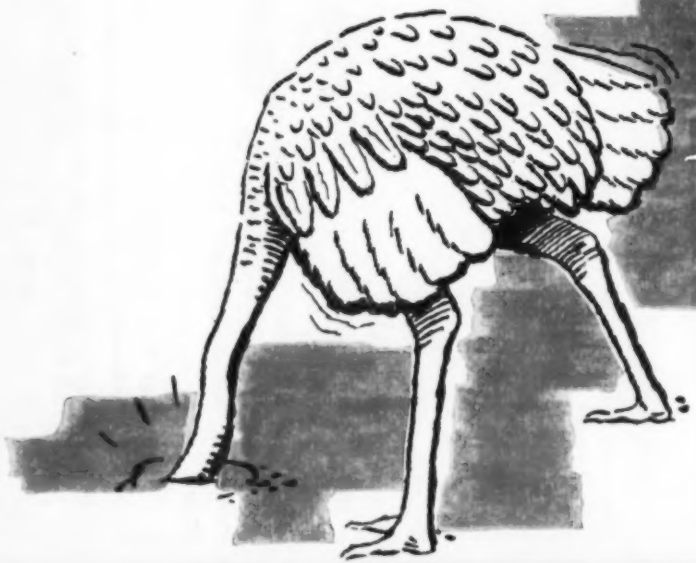
SARANAC MACHINE CO.

BENTON HARBOR, MICHIGAN

Manufacturers of the World's Largest Line of Fastening Machinery

See Action Card, page 160. Circle No. 216

Let's Face It!



OBSOLETE EQUIPMENT TAKES MONEY OUT OF YOUR POCKET

Those old machines saddle you with high operating costs and low productive output.

YOUR POCKET

Those old machines saddle you with high operating costs and low productive output. They limit your design and interrupt your production. They tax you for more than "old age benefits" . . . they make you pay the full penalty of obsolescence . . . they take profit out of your pocket. How long has it been since you walked through your shop and said to yourself for the first time, "I'll have to get rid of those old clunkers one of these days"? Had you replaced them with modern woodworking machines at that time, they would have more than paid for themselves and be yielding a profit for you today.

Put a profit in your woodworking with MODERN MACHINES

WOODWORKING MACHINERY · MANUFACTURERS' ASSOCIATION · WMMA

WOODWORKING MACHINERY MANUFACTURERS ASSOCIATION

1900 ARCH STREET
PHILADELPHIA, PENNSYLVANIA

WOODWORKING MACHINERY MANUFACTURERS ASS'N.
1900 ARCH ST., PHILADELPHIA, PA.

Please send further information. I am interested in the following types of machinery_____

Name_____

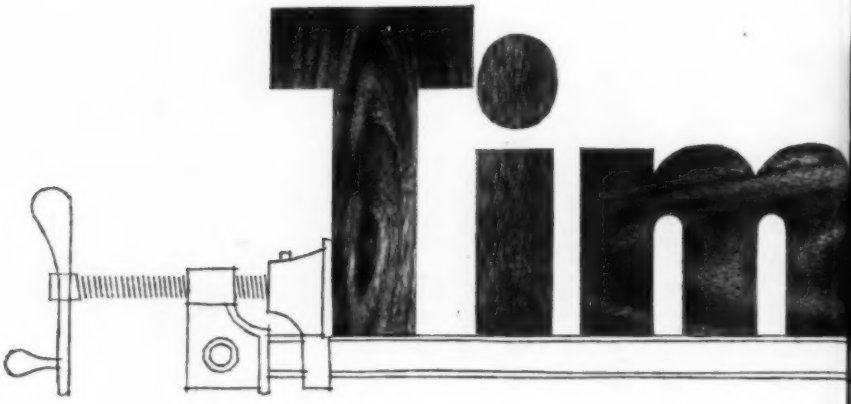
Company_____

Address_____

City_____ Zone_____ State_____

See Action Card, page 160. Circle No. 217

Density-keyed to 40 kinds of wood!



Armour's revolutionary new line of polyvinyl resin adhesives

No longer do you have to guess which glue is right for the wood you use. Now Armour's new TIMBOND line of adhesives, *density-keyed to 40 kinds of wood*, solve that problem for you!

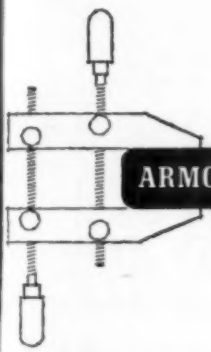
That's because TIMBOND adhesives are scientifically formulated in Armour research laboratories to vary in strength according to the densities of different species of wood. So you're assured of maximum adhesive performance for every kind of wood you use, and since a TIMBOND adhesive takes the place of several different types of glue —you save money!

This versatile new line of TIMBOND adhesives produces bonds of superior strength and shock resistances equal to or greater than the strength of most woods. They dry quickly, are odorless, mold-proof, vermin-proof, water-resistant, light-colored. No diluting or heating is necessary—they're supplied ready to use! Application can be made by roller, glue gun or brush.

Mail coupon and designate the wood or woods you use. Do it today and we will promptly send you product and ordering data on the TIMBOND adhesive density-keyed to your woods.

Armour and Company • 1355 West 31st Street • Chicago 9, Illinois
Delaware and Spring Garden Streets • Philadelphia 23, Pennsylvania
290 Rutherford Avenue • Charlestown 29, Massachusetts
120 Broadway • New York 5, New York
2501 83rd Street • North Bergen, New Jersey
235 South Hamilton Street • High Point, North Carolina

bond®



ARMOUR *Adhesive Division*

Makers of a complete line of adhesives for woodworking—chrome glues, hide glues, liquid hide glues, polyvinyl resin emulsions

CLIP AND MAIL TODAY! W10

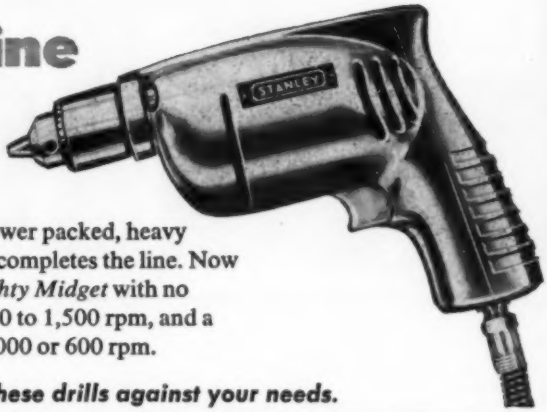
mour and Company
55 West 31st Street, Chicago 9, Illinois
ould like further information on TIMBOND.

use_____ in
(name of wood or woods)
y woodworking operations.

*Name*_____ *Title*_____
*Firm*_____
*Address*_____
*City*_____ *Zone*____ *State*_____

See Action Card, page 160. Circle No. 218

A new 'Mighty Midget'® rounds out famous line



No. 236 — ¼" chuck
— 1500 rpm

Every *Mighty Midget* is a power packed, heavy duty drill. The new No. 236 completes the line. Now you can get a ¼" chuck *Mighty Midget* with no load chuck speeds from 5,000 to 1,500 rpm, and a ⅜" chuck model rated at 1,000 or 600 rpm.

Check these drills against your needs.

Drill No.	Chuck Size	Capacity	No Load Chuck Speed	Length Overall
232	¼"	¼" in steel ½" in hard wood	5000	8⅛"
233			3500	
234			2500	
235			2000	
236			1500	
237	⅜"	⅜" in steel 1" in hard wood	1000	8½"
238			600	

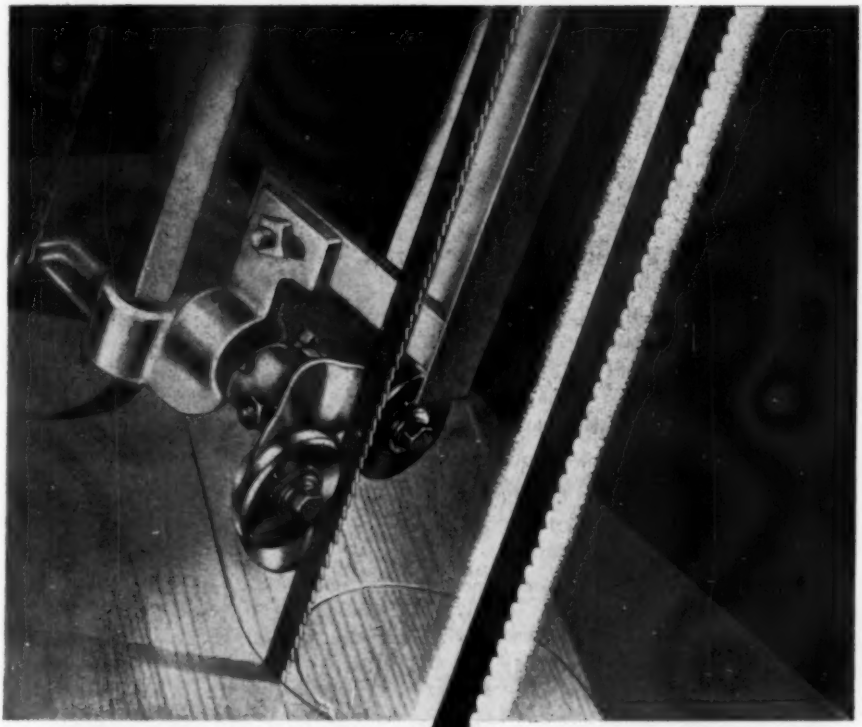
Every *Mighty Midget* has anti-friction bearings, trigger switch with locking device and aluminum die-cast housing with high polish Stanley finish. Your industrial distributor is now able to demonstrate the whole line. Call him or write Stanley Electric Tools, 790 Myrtle St., New Britain, Conn., for further details.

STANLEY

The Stanley Works • New Britain, Conn.

ELECTRIC TOOLS • TOOLS • HARDWARE • STEEL • STEEL STRAPPING

See Action Card, page 160. Circle No. 219



Two Types of SIMONDS Narrow-Band SAWS

Which one should you use?

FILING TYPE — If you've got sharpening facilities, this may be the blade for you. Made of Simonds own special steel, they're unusually tough. A generous hook in the teeth makes cutting fast and easy. Round gullets and well-rounded saw backs prevent cracking. Burr-free teeth are filed extra-sharp . . . given a precision set. Tops in every respect, they're the finest, longest lasting blade of their type.

DISPOSABLE TYPE — Made of tough, alloy steel with only the tooth edge hardened. Simonds new Sabre Tooth Saw (or standard Skip-Tooth) provides extra gullet capacity and permits faster cutting. Flame hardened tooth edge provides many times more cutting life. Saves on blade replacement and sharpening costs — blade is merely thrown away when edge finally goes.

Both type blades are made in all standard widths, thicknesses and tooth sizes, in coils or welded-to-length. Now stocked by your Industrial Supply Distributor.

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que.
Simonds Abrasive, Simonds Steel Mill, Lockport, N.Y.
Heller Tool Co., Newcomerstown, Ohio
Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

For Fast Service from Complete Stocks

Call your SIMONDS Industrial Supply DISTRIBUTOR

See Action Card, page 160. Circle No. 220

IS SAFETY OVER-RATED ?

The Editor's Page

General observation leads us to believe that the woodworking industry as a whole thinks safety is over-rated. Perhaps because safety is one of those intangibles that cannot always be written in the ledger; or because of the thousands of accidents that could have happened, but somehow didn't.

Many of us think of safety only in the presence of an accident. If a plant has no lost-time accidents, is it a safe place to work? Not necessarily. Employees may be carrying the load for safe working in spite of management's negligence to provide a safe working place.

Unless we realize the results of unsafe practices, it will too often appear that safety is over-rated. Here are just a few questions that ought to be faced and reviewed often.

The employee who is negligent about safe practices, should take time to think through these questions:

Without a hand, what would my earning potential be? If I lost an eye? An arm? This may be morbid, but a hard, cold fact. Last of all, "What would happen to my family should I die or be totally disabled as the result of my own carelessness?" In the light of these answers, what about the chances I take?

Management should provide the safe place to work and enforce safe working practices. But again, because of the accidents that do not happen, it is easy to be negligent. Management may be able to face the issue impersonally, but there still are nagging questions to be answered.

"What if John Doe becomes totally disabled and is a burden to his wife and growing family because we've helped him to be careless, or made it necessary for him to work under unsafe conditions?"

Facts and figures—insurance rates and production totals—lined up neatly on charts or tables do not mean as much as the human factor. Look instead into the faces of your employees and project yourself into their home situations.

If our attitudes toward safety are to change, we need to realize: that an accident can happen to anyone; that the absence of accidents does not always mean a high safety rating; that safety involves people and their welfare.

Many of us think of safety only in the presence of an accident. If safety program, then safety is not over-rated!

. . . for increased assembly time of glue-spread veneers
. . . for improved durability

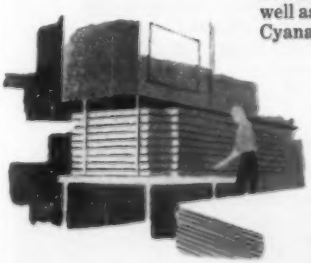
UPGRADE YOUR UREA-FORMALDEHYDE ADHESIVES WITH CYMEL* RESIN 401

You get a really marked improvement in the performance of urea adhesives when you fortify them with CYMEL Melamine Resin 401.

FOR EXAMPLE: Here's what happens as you increase the amount of CYMEL 401 in standard URAC® 180 or 186 glue formulas:

% CYMEL 401 (of Resin Solids)	Maximum Assembly Time (Hours)		Durability (Boil Resistance — Hours Without Delamination)	
	Unextended Formulation	Intermediate Flour-Extended Formulation	Unextended Formulation	Flour-Extended Formulation
0	less than 3	less than 3	less than ½	less than ½
5	12 – 15	10 – 12	1	1
10	15 – 20	20 – 24	2	2
15	20 – 24		3	
20	20 – 24		4	

CYMEL 401 gives you more *versatile* assembly time, too – *shorter* as well as *longer* than possible with unfortified urea adhesives. Call your Cyanamid sales office for complete information.



*CYMEL is American Cyanamid Company's new trademark for its melamine-formaldehyde resins.

Offices in: Boston • Charlotte Chicago • Cincinnati Cleveland • Dallas • Detroit Los Angeles • New York Oakland • Philadelphia • St. Louis • Seattle

CYANAMID

AMERICAN CYANAMID COMPANY
PLASTICS AND RESINS DIVISION
32A Rockefeller Plaza, New York 20, N. Y.

In Canada: North American Cyanamid Limited, Toronto and Montreal

See Action Card, page 160. Circle No. 221

Memo TO MANAGEMENT

Business Outlook

Most of the forecasters see a likelihood that from now through the end of the year will bring brisk business activity. Money is tight, but the consensus is that business will make a satisfactory adjustment to the credit stringency.

The recent trend has been to higher prices on such items as steel, aluminum, TV sets, refrigerators, tires, household appliances, construction equipment, typewriters, carpets and assorted industrial raw materials. This list is by no means inclusive.

Record outlays for new plant and equipment, combined with a leveling off in corporate profits and large working capital needs, have resulted in a strong demand for borrowed funds on the part of business. Despite the steel strike, business loans at weekly reporting banks in leading cities have increased $2.4 billion this year as against $1.5 billion in the same weeks of 1955.

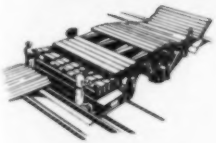
Employment

Employment runs at historic highs. Latest figures show that national average of claimants for unemployment insurance is only 29 per 1,000 workers. The Federal government has disclosed that a recent figure for total employment is an all-time high of 66.8 million. Coupled with the persistence of capital expansion projects by industry, there should be assurance for the boom to continue for another year, according to the experts.

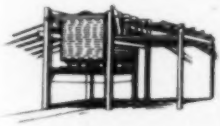
Production

National Oak Flooring Manufacturers' Association says volume of 561 million board feet in the Southern and Appalachian regions in the first half of 1956, comes within 9% of the all-time high for the period registered in 1955.

Moore Stacker - Unstacker Systems put POWER to work - Save handling costs

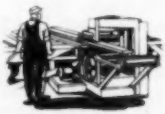


Moore Stacker



Moore Unstacker

Moore Breakdown Hoist



Moore Electric Swede

High - cost BOARD-AT-A-TIME handling is obsolete!

Moore Stacker-Unstacker Systems POWER-HANDLE lumber by courses and loads. They do it better—faster—and cheaper.

Learn how a Moore Stacker-Unstacker System can fit your plant layout—the savings* will surprise you. Write today for information.

*Many plants find these savings pay for equipment in one or two years . . . or LESS!

MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

JACKSONVILLE FLORIDA | BRAMPTON, ONT. CANADA | VANCOUVER, B. C. CANADA | NORTH PORTLAND OREGON

See Action Card, page 160. Circle No. 222

Prefab market continues strong. National Homes Corp., Lafayette, Ind., has turned out its 100,000 prefabricated house. Company was organized in 1940. Spokesman says the firm expects to make its 200,000 home within the next six years.

Decline in housing starts is a factor in lumber production. Production of lumber from the Northwest is continuing at low levels while mills struggle to brake the downward drift of prices brought on by a decline in orders. Some mills plan to curtail production rather then sell at a lower price.

Market shipments of hardwood plywood, except container and packaging plywood, amounted to 212.2 million square feet, surface measure, in the second quarter of 1956. These and other statistics gathered by the Bureau of Census, Department of Commerce, indicate that hardwood plywood shipments—plywood, veneer core plywood—a little under 1955. However, stocks on hand are above 1955.

Research

University of Florida is conducting tests on sawdust as a boon to mushroom development. Ton of sawdust mixed with oatmeal grew 500 lbs. of mushrooms in two weeks. Use of sawdust mixtures may help eliminate seasonal growing of mushrooms.

Hybrid poplars from Germany which make peeler logs in 28 or 30 years, compared with a minimum of 40 years for Douglas fir, are being tested by a British Columbia firm, Western Plywood Co., Ltd.

U. S. Department of Agriculture, Forest Service, as part of a nationwide review of timber resources has found that two-thirds of the land in Massachusetts is forest land, but the state is not producing nearly as many trees as it could. More research will follow to determine better utilizations of forest land.

State Department of Agriculture and Conservation of Michigan will conduct a survey on oak wilt disease. Oak wilt is spotty in Michigan, but is persistent in its attacks on red, black and pin oaks, killing the trees within two weeks.

Koppers Company, Inc., is expecting to organize and build the first wood treating plant in Guatemala. At present time wood is not considered a permanent building material in Central America because of the tropic weather conditions. Development of pressure-treated wood will result in new opportunities for wood in this area.

The Oregon Forest Products Laboratory, in cooperation with the U. S. Forest Products Laboratory, will begin research on mountain hemlock. More than four billion board feet of the species grows in the Cascade Mountains.

Graphic evidence of the value of a good paint job on glued laminated timbers has been verified by 12-year exposure tests conducted by the U. S. Forest Products Laboratory, Madison, Wis. Destructive action of weather seriously split the unprotected timber, while the painted one remained practically free of deterioration. About 75 million board feet of laminated lumber is produced in the United States each year.

to help you select the proper mortising and boring tools for fast, accurate production

Here's a handy guide you'll want for regular reference. New GREENLEE Catalog 34-M gives complete information on hollow chisels and bits, router bits, machine bits and drills, dowel bits, countersinks, plug cutters, and other high-quality tools that increase efficiency of woodworking machines.

This well-illustrated, 20-page book shows tools in detail . . . quickly gives data on sizes and types for easy selection of tools best suited to your work. Also includes tool sharpening instructions and a helpful wood screw boring chart.

If you haven't a copy, or need more copies, write today for Catalog 34-M. Greenlee Tool Co., Division of Greenlee Bros. & Co., 2140 Herbert Ave., Rockford, Illinois.

TOOLS FOR CRAFTSMEN
GREENLEE

See Action Card, page 160. Circle No. 223

Procurement

Prospective bidders may obtain complete bid sets by writing to purchase office which is listed with each item. Identify the bid invitation by including all of the information given in the listing.

WOOD HANDLES-Spec. FED-H-B-71A, 57960 ea. Handle Hardwood, Spec. FED-H-B-651A Amend 1, with GSSO Spec. Exception 38-36., 53100 ea. IFB 155-45157B bid open, 9/19/56. General Stores Supply Office, 700 Robbins Ave., Philadelphia, Pa.

PLYWOOD, container grade, Type II, Class I, permitting 40% cutbacks-879700 s.f.-IFB 57-89B-bid open 10/2/56. Supply and Procurement Div., South Atlantic Div., Corps of Engineers, P. O. Box 1889, Atlanta 1, Ga.

DESKS, wood flat top, 66" x 34", 25 ea.-IFB FNW-1f-4216-A. Bid opens 10/8/56. General Services Admn., Region 3, Business Service Center, Washington 25, D.C.

LUMBER, Douglas fir-Grade D finish, Int. Fed. Spec. MM-L-0075LD and Paragraph 102.D of WCLIB Standard Grading & Dressing. Rules No. 15-9016 bd. ft.-IFB SF-1697-bid opens 10/2/56. Bus. Service Center, Gen. Services Admn., San Francisco 3, Calif.

PALLET, hardwood-48" x 60", with nails, 52520 ea.-same except 32"x40", Spec. NN-P-71, 3080 ea. Bid opens 10/4/56. Navy Purchasing Office, 4th & Independence Ave., Washington, D.C., Attn. SPF-1A.

Coming Events

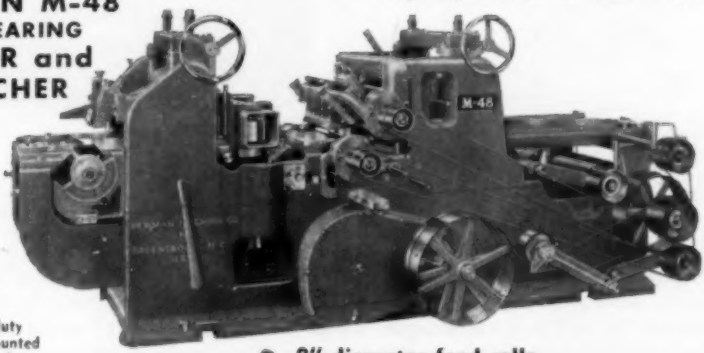
Important dates include:

Oct. 18-20—Chicago	National Hardwood Lumber Association Annual Meeting and Convention
Oct. 19—Chicago	Maple Flooring Manufacturers Association Special meeting during N.H.L.A. Convention
Oct. 22-25—St. Louis	Protective Packaging & Materials Handling Exposition
Oct. 24-26—Rockford, Ill.	Midwest Meeting, Forest Products Research Society "How to Get the Most From Machines"
Oct. 25-26—New York	Forest Products Research Society, Northeast Section "Use of Wood in the Modern Home"
Dec. 10-13—Chicago	National Retail Lumber Dealers Exposition
Dec. 10-13—Chicago	Materials Handling Clinic (Part of above exposition.)

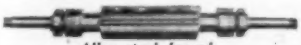
You asked for it

The low cost planer and matcher with the FEATURES of the high priced machines

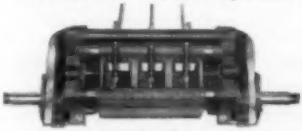
NEWMAN M-48
BALL BEARING
PLANER and MATCHER



Heavy duty quill mounted side head spindles.



Alloy steel forged "DYNETRICALLY" balanced cylinders.



Sectional chipbreaker available.

Bottom head pulls out for quick grinding and changing of knives.

- 8" diameter feed rolls.
- All cutterhead bearings— interchangeable.
- Built-in jointing devices.
- Ball bearing belt tighteners— for all belts.
- Inclined bottom bed plate.
- All gears interchangeable— heat treated steel.

"A full car load of beautifully finished Lumber every day"

DELIVERY FROM STOCK — *IF YOU HURRY*

WRITE US TODAY
FOR FULL DESCRIPTIVE LITERATURE AND QUOTATIONS

Newman **NEWMAN MACHINE COMPANY, INC.** Newman
GREENSBORO, NORTH CAROLINA · U.S.A.

See Action Card, page 160. Circle No. 224

POINTED PARAGRAPHS

Hardwood takes a political turn. Were you as a TV viewer aware of the emphasis given wood television cabinets by some manufacturers? Both Philco Corp. and RCA emphasized the beauty of wood cabinets in commercials during the political campaigns. Color TV should do even more in selling the public on the beauty of wood in furniture, paneling and other home utilizations.

Max Shore, speaking before the N.A.F.M. convention in Chicago, said, "Every home should have furnishings that families are proud of—and that point can again be sold to the public." Spot TV commercials may be part of the answer.

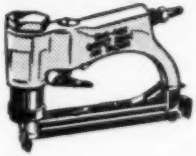
Hi-Fi equipment is still selling like the proverbial "hot-cake." Read the story on page 122, describing use of plywood in manufacture of hi-fi cabinets. Music store owners claim to have booked 150% more business in sales of hi-fi than a year ago.

A General Electric Company engineering expert predicts that future American homes could be heated and cooled and lighted by rooftop banks of solar batteries. Another futuristic trend is the star-shaped house developed by Architect Albert C. Ledner of New Orleans. Ledner's house is a wood frame structure, but it is radically different from the conventional brand. Dominating feature is the 12-gabled, 12-pointed, pleated "star" roof.

Press Department, Egyptian Embassy, 2310 Decatur Pl., N.W., Washington 8, D.C., has available an interesting pamphlet called "The Suez Canal—Facts and Figures."

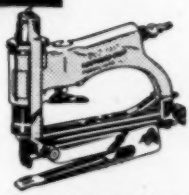
National Wooden Box Association indicates that containers used one tenth of the total amount of lumber consumed in the United States during 1955.

DUO-FAST Tackers and Staplers for the WOODWORKING INDUSTRY



DUO-FAST AIR TACKERS

Fast, effortless, efficient tackers for production work. 20 various models.



DUO-FAST AIR PLIER

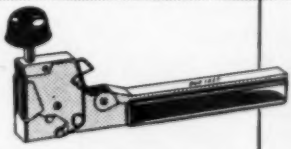
Light, easily portable air-driven staplers. 8 various models.

DUO-FAST GUN TACKERS

Great all-purpose hand tackers. 18 various models.

DUO-FAST HAMMER TACKERS

Fastest, manual tacking method. 6 various models.

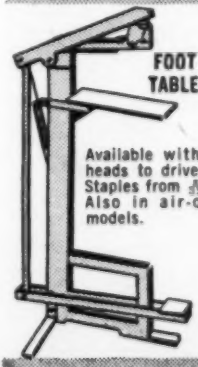


DUO-FAST STRIKE TACKERS

Two-hand tackers for accurate placement of staples. 15 various models.

DUO-FAST STAPLES

Range from 1/4" to 3/8", in various wire sizes and widths, regular or rustproof wire, and in colors.



FOOT POWER TABLE TACKER

Available with various heads to drive Duo-Fast Staples from 1/4" to 1/2". Also in air-operated models.

At Your Service . . .

Duo-Fast offers a complete line of Staplers, Tackers, and Staples–a Free Service Guarantee –and 50 sales and service offices to help you with your fastening problems.

Write for complete Duo-Fast Story.

DUO-FAST

FASTENER CORPORATION

860 Fletcher Street, Chicago 14, Illinois

See Action Card, page 160. Circle No. 225

Interesting to all manufacturer's selling to the average American is "Life Magazine's" new color motion picture, "Opportunities Unlimited." Here are a few of the things covered by the film: mushrooming growth of suburbia, need for hospitals and schools and construction of new highways. The film will be shown to businessmen throughout the country by regional sales offices of the magazine.

Perhaps we are not always aware of the close relationship between growing lumber and using it as a basis of our manufacturing operation. We are very dependent as manufacturers upon a constant source of supply. Paul Y. Burns has written a very fine article, "Can Aerial Spraying Control Hardwoods?" It appears in the September issue of the "Forest Farmer."

Another plant tour has been sponsored by the Hardwood Dimension Manufacturers' Association. The tour took place September 24-26 and covered plants in the Appalachian area. Member plants were visited and plenty of opportunity provided for exchange of techniques and problems.

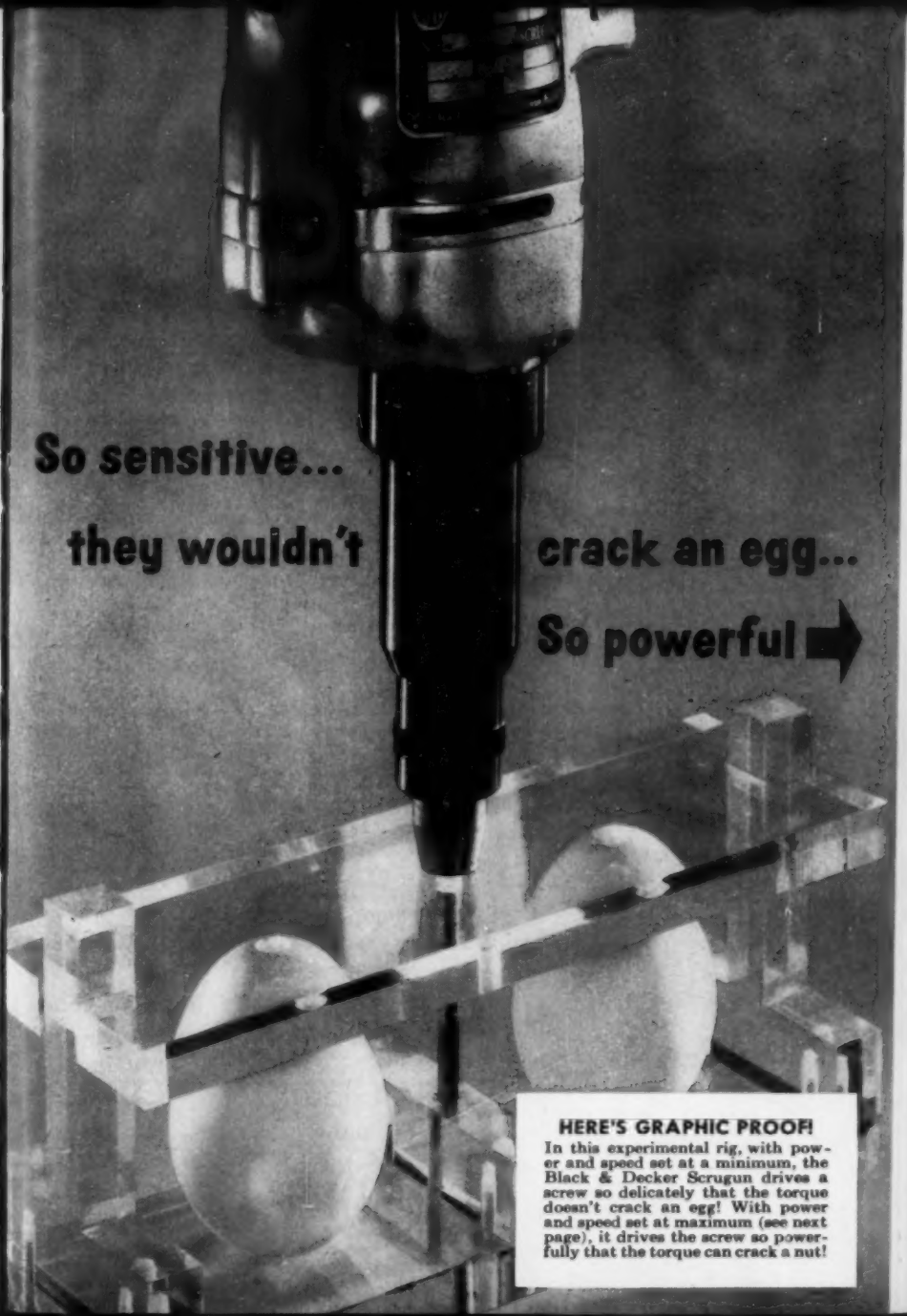
Twenty million Douglas fir seedlings at Nisqually, Wash., have been dedicated to keeping green the memory of Col. W. B. Greeley, an outstanding American forestry leader through the years 1905-1955.

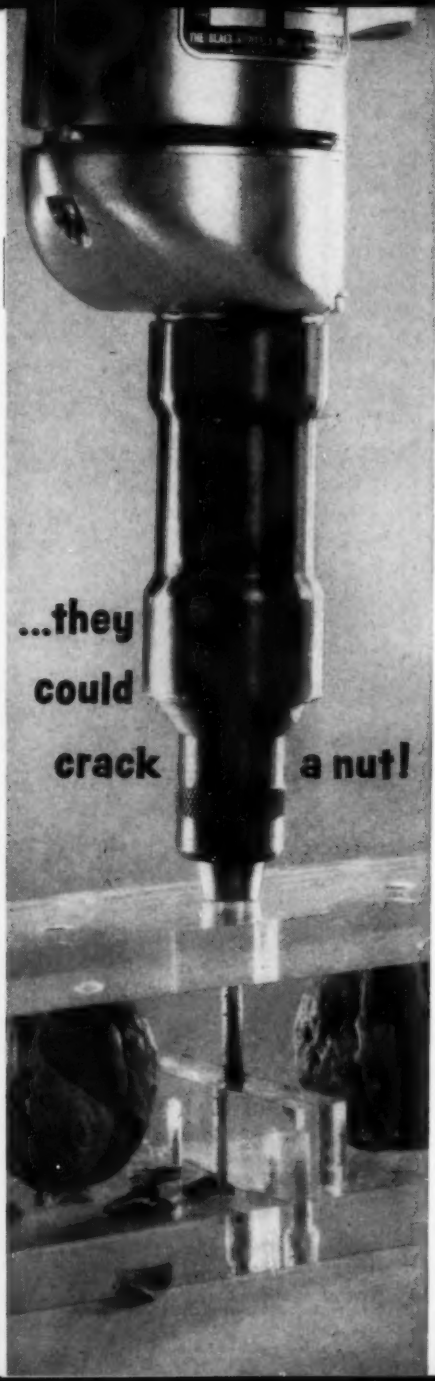
U.S. Plywood Corp. is bonding a Micarta surface to its solid core, staved lumber core and hollow core doors. This provides an interior door which will resist protracted abuse in public buildings.

Too late to include in our Letters to the Editor, but maybe someone can help in supplying large quantities of 9-ply plywood cutting boards 7½" in diameter. If interested, write the Editor.

SAFETY EMPHASIS—This October issue of WOOD WORKING DIGEST has emphasized safety in a variety of ways. Don't miss any of these features:

1. Did you pass the safety quiz in the Finishing Section?
2. Is your operation as safe as the M & M Box operation?
3. What makes a big fire big?
4. Is safety over-rated? (See Editor's Page.)
5. Can you fire an employee for being accident-prone? (See the editorial feature "Right or Wrong.")
6. Is Safety an important part of your plant operation? If not, why isn't it important to you? We'll be glad to have your comments.


So sensitive...
they wouldn't
crack an egg...
So powerful
HERE'S GRAPHIC PROOF!
In this experimental rig, with power and speed set at a minimum, the Black & Decker Scrugun drives a screw so delicately that the torque doesn't crack an egg! With power and speed set at maximum (see next page), it drives the screw so powerfully that the torque can crack a nut!



NOW Black precise control

New "Power-Speed Control" lets you choose the correct speed and tension — from finger-lightness to wrench-tightness!

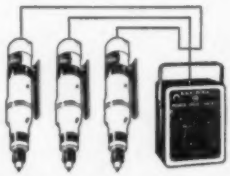
Now, with new "Power-Speed Control," the improved line of Black & Decker Scruguns brings all the advantages of controlled electric power to *every* screwdriving application!

They drive machine screws ranging from No. 0 to ¼" in all materials. You choose the precise torque you want—from 1 in. lb. to 145 in. lbs. You choose the precise speed you want—from 500 to 3000 rpm. And operation is quieter, cooler, cleaner, with one-hand control.

Operating and maintenance costs drop. Armatures, bits and brushes last longer. Installation is quick and inexpensive.

Black & Decker gives you a choice of 56 models—*power-built* to *last!* Regardless of your application, you can't afford to miss a free demonstration. See your Black & Decker distributor today or write: THE BLACK & DECKER MFG. Co., Dept. 2710, Towson 4, Md.

B&D "Power-Speed Control"



Unit handles as many as three adjustable clutch Scruguns. Reduces costs and increases life of tool. Rates at 5 amperes. Unlimited life.

Look in the Yellow Pages under "Tools-

B&D Black & Decker

Portable electric tools

& Decker SCRUGUNS® provide impossible with other power drivers!

No. 8 Scrugun: Lightest, most compact tool for driving up to No. 8 machine screws and nuts, up to No. 8 self-tapping screws and up to No. 8 x 1-¼" wood screws.

New, Advanced No. 10 Scruguns: Single adjustable clutch and reversing switch permit close-quarter work. Drives up to No. 10 x 2" wood screws, up to No. 12 self-tapping screws, and up to ¼" diameter machine screws and nuts. Available as pistol-grip handle model with "piggy-back" reversing switch . . . or center-drive model with paddle switch—with positive clutch available on both models.

No. 12 Scrugun: Pistol-grip handle. Exclusive "piggy-back" reversing switch. Drives up to No. 12 x 2" wood screws, up to ¼" self-tapping screws, up to ⅜" x 2" lag screws, and up to ¼" diameter machine screws and nuts.

3 TYPES OF CLUTCHES! Black & Decker adjustable clutches permit tightening to screw manufacturers' specifications . . . reduce kickback . . . lower torque . . . cut operator fatigue . . . permit uniform adjustment . . . prevent overloading.

Single Adjustable Clutch minimizes stripping, tearing, reduces burring.

Electric" for Nearest Distributor

Decker®

—power-built to last!

Positive Clutch wherever definite torque adjustment is unnecessary.

Double Adjustable Clutch eliminates stripping, tearing, reduces burring.

BE INFORMED ON WOOD GLUING

Interested in glues and gluing? If so, your name should be on the mailing list of THE PERKINS GLUE LINE. This house organ of Perkins Glue Company is mailed free of cost or obligation to all who request it.

Recent issues of THE GLUE LINE have carried articles on a wide variety of subjects including: Glue Selection, Glue Handling & Storage, High Frequency, Moisture Content Detection, Moisture Control, Hardwood Plywood Imports and similar topics.

Don't miss a single issue of THE GLUE LINE! Mail coupon below to Perkins Glue Co., Lansdale, Pa. today. Be informed on wood gluing!

the PERKINS GLUE LINE

Form of R.F. Energy Principal Factor In Choice of Adhesive for R.F. Gluing

Heated Storage Area Lowers M.C.; Check Stock Before Resin Gluing

Please place my name on your mailing list

Mr. _____

Company _____

Address _____

City _____ State _____

Mail to: Perkins Glue Company, Lansdale, Pa.

PERKINS GLUE COMPANY

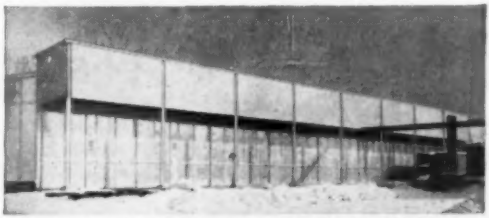
LANSDALE, PA • HIGH POINT, N. C • SHAWANO, WISCONSIN
KITCHENER, ONTARIO • LA CHUTE, QUEBEC

See Action Card, page 160. Circle No. 227

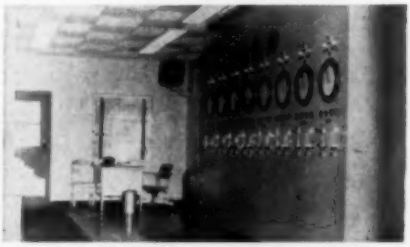
Gunlock wanted the best –

GUNLOCKE CHOSE STANDARD PREFABRICATED DRY KILNS!

● **The W. H. Gunlocke Chair Company has one of the most up-to-date furniture manufacturing plants in the country at Wayland, N. Y. In keeping with this modern plant, they wanted to install the finest, most modern kiln equipment and buildings available. Result: they replaced outmoded kilns and buildings with eight new Standard Prefabricated Dry Kilns! Requiring little maintenance, the buildings have an insulation value impossible to duplicate with masonry construction. Circulation of air is effected by Standard's efficient direct-driven, internal-fan system under full automatic control . . . *used successfully for years in thousands of installations.***



Front view of Gunlocke's eight new Standard Prefab Kilns.



Automatic controls for all eight kilns are conveniently located in this spacious, neat-appearing room.

For additional information, write for our FREE Prefab Dry Kiln brochure!

Manufacturers of Internal Fan Kilns

STANDARD DRY KILN COMPANY

P. O. BOX 5708 . . . INDIANAPOLIS 21, IND.

BRANCH OFFICE: REDMAN ENGINEERING SERVICE • HIGH POINT, N.C.

See Action Card, page 160. Circle No. 228

NAFM Board of Directors meet at annual convention, August 26-30, 1956.

NAFM Equipment Fair

Highlights from the National Association of Furniture Manufacturers Second Annual Supply, Equipment and Fabric Fair held in Chicago

Old and new presidents: Kenneth Kroehler (right) retiring president and N. A. Eddy, president of Habitant Shops, Bay City, Mich., incoming president.

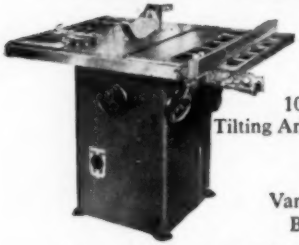
Percy A. Tonk (left), NAFM treasurer and chairman of the board, Tonk Mfg. Co., receiving safety award of the NAFM from Jerome L. Metz.

Kenneth Kroehler, NAFM president, 1955-56, cutting ribbon to open the 1956 NAFM Supply, Equipment & Fabric Fair.

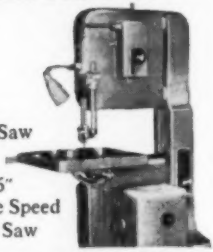
Tinsley W. Rucker, addressing the Labor Relations Session on subject of training supervisory personnel.

J. A. Hager, moderator at a panel on color control of furniture finishes.

WALKER-TURNER



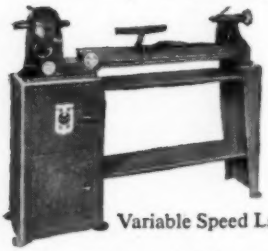
10" Tilting Arbor Saw



16" Variable Speed Band Saw

6" Jointer

Your March, 1956 issue of WOOD WORKING DIGEST included a 32-page Catalog of Walker-Turner "Light-Heavyweight" Machine Tools that will save time and money in your plant!



Variable Speed Lathe

1300 Series 15" Drill Press

2-Speed Vertical Spindle Shaper

If that issue isn't handy, write today and we'll send you FREE copy of the new Catalog. Then you can *compare*, and see why you get a lot more for your money when you buy "Light-Heavyweights"!

DRILL PRESSES, HAND AND POWER FEED — AIR FEED DRILL PRESS ATTACHMENT
RADIAL DRILLS — WOOD AND METAL CUTTING BAND SAWS — TILTING ARBOR SAWS
RADIAL SAWS — JIG SAWS — CUT-OFF SAWS — LATHES — SPINDLE SHAPERS
JOINTERS — BELT AND DISC SURFACERS — FLEXIBLE SHAFT MACHINES

walker-turner

WALKER-TURNER

Division

Rockwell Manufacturing Co. • Pittsburgh 8, Pa.

See Action Card, page 160. Circle No. 229

Letters To The Editor

"We are looking for a source of stock for wooden balls 1½" to 2" diameter. We need to purchase them in quantities from 500—1000 in a lot."

—G. B., Colo.

"Thank you for the fine article on plywood packaging (June 1956). We have sent copies of this article to many of our people."

D. W., Mass.

"One of our customers is looking for a sanding machine with the trade name, 'Speed-Sander.' Can you help us locate the manufacturer of this particular machine?"

—H. A., Fla.

"I am well acquainted with Stetson-Ross and Woods molders. I would like to know other manufacturers of molders up to 4" x 12" in size."

—W. T., Wash.

"We are looking for a reference that will give us a list of standard use in woodwork. Standard sizes of wood paneling, veneers and finished lumber. We are contemplating the manufacture of wood products."

—A. A., Colo.

"I am general manager of a large furniture manufacturing plant in Australia. In planning a trip to the U. S. for November and December, what exhibits could I visit? Also, are there up-to-date factories producing bedroom furniture and prefabricated cupboards which I might visit?"

A. G., Australia

"We are interested in locating a concern that manufactures or can manufacture a machine to make canoe paddles."

—V. O., Minn.

"Where can we obtain celluloid (or similar composition material) 1/16" x 3/32" x 3' long, having an appearance of ebony for inlay?"

—W. D., Penn.

"We are preparing to manufacture a new type of sled and are trying to trace a source for hardwood lumber for the slats on the top of the sled. The lumber could be oak, beech, maple, ash, elm or any hardwood now used on sled tops. Thickness should be 5/16"; 3/8" or 1/2" rough."

—H. T., Minn.

"Where can we buy a leather crimper and a leather roller? Also adhesive for applying leather to table tops?"

—A. M., North Carolina

"In the September issue there was an article on plywood in prefabs. Can you supply us with the names and addresses of all manufacturers mentioned?"

—W. G., La.

"We are looking for a hand operated electric tool for removing mud and bark from log surfaces before sawing. Not all the bark, just where the saw will cut."

C. V., New York

"Will you please send me some copies of 'American Woods' which your firm published? They have been recommended to be for use in our high school."

—C. P., Texas

"We shall appreciate your cooperation in helping us contact manufacturers who are equipped to make contour shaped legs for our new line of contemporary tables. We can send samples of legs now being used."

—H. M., New York

Hardwood Plywood Institute was winner of First Place, Classification A. Left to right: C. E. Close, manager of the institute; D. E. Nichols, past president and R. D. Behm, director of the trade promotion program for HPI.

WINNERS RECEIVE The Award of Merit Citation

FOR the last three years, WOOD WORKING DIGEST has sponsored a contest to publicly reward firms and associations who have promoted the desirability of wood over other materials and the use of wood products.

The Third Annual Contest winners received their citations recently. Chicago winners—the Hardwood Plywood Institute, Architectural Woodwork Institute and Pacific Lumber Company—were feted at a luncheon, held at the Union League Club. West Coast winner, Consolidated Machinery & Supply Company, Los Angeles, received the citation in a special ceremony at the plant.

Manufacturing and merchandising of wood products must go hand-in-hand. These four first place winners had, in the opinion of the judges, done outstanding work during 1955 in merchandising their products. Various types of publicity were used to acquaint the public with the product—newspaper advertising, consumer and trade press advertising, brochures, booklets and other literature, were used to good advantage in campaigns conducted by these organizations.

Every winner in the contest received an Award of Merit citation. Cash prizes were also given to first place winners. The Award of Merit citation is printed on German parchments, beautifully hand finished and mounted on a solid walnut base with a recessed glass face.

Contest divisions are classified by product manufactured or merchandised:

A. Lumber, dimension stock, veneer and plywood.

First place winner—Associations

The Hardwood Plywood Institute
Chicago, Illinois

Vincent Hogren, executive vice-president of the Hitchcock Publishing Company, presenting first place award to John Reno of The Pacific Lumber Company.

Honorable Mention—Associations
West Coast Lumbermen's Association
Portland, Oregon
First Place—Companies
Pacific Lumber Company
Chicago, Illinois
Honorable Mention—Companies
Gulf Enterprises
New Orleans, Louisiana

B. Products made from wood waste.
No entries in the Third Contest.

C. Finished wood products.
First Place—Associations
Architectural Woodwork Institute
Chicago, Illinois
Honorable Mention—Associations
National Wood Pallet Manufacturers Association
Washington, D.C.
Honorable Mention—Companies
Laity Manufacturing Co.
Hellam, Pennsylvania

D. Wood components.
No entries in Third Contest.

E. Materials or machinery that make possible an expanded use of wood.

Consolidated Machinery & Supply Co., Ltd., won first place in classification E. Russ Eagles, company sales manager on the left; Keith Evans WOOD WORKING DIGEST district manager on the right.

First Place—Companies
Consolidated Machinery & Supply Co., Ltd.
Los Angeles, California
Honorable Mention—Companies
The Borden Company
New York, New York

F. Schools, colleges and universities.
Honorable Mention
State University of New York, College of Forestry
Syracuse, New York

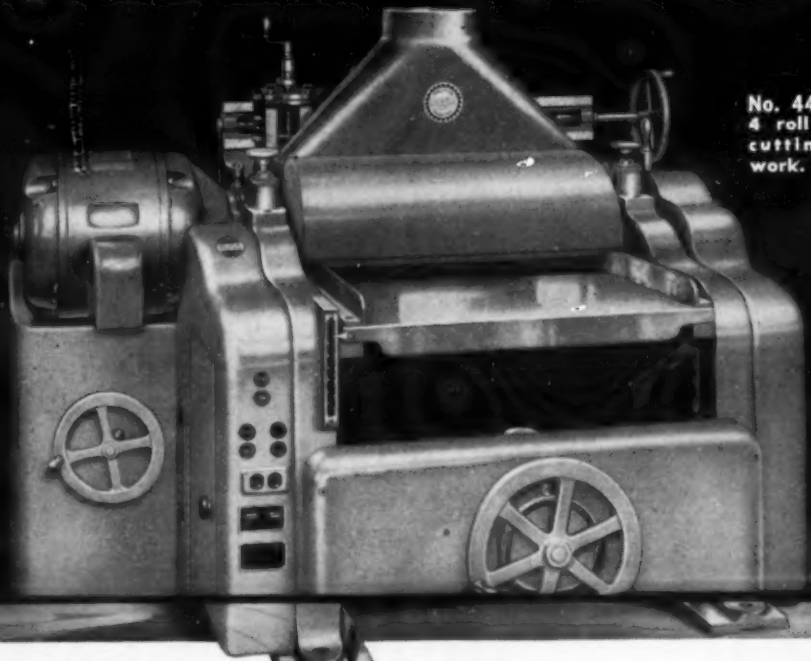
The Award of Merit citation has become a coveted honor. We believe it has been a necessary step in the right direction. The public must want the products that the woodworking industry has to offer. Only in this way can we hope to meet and beat competition from other materials.

What are you doing to publicize wood and promote wood products? Plan now to enter the next Award of Merit Contest. Entry blanks will be available after January, 1957.

Here's why

BUSS CABINET SURFACERS

ARE UNMATCHED FOR PRECISION PLANING



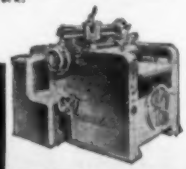
No. 44 Single Surface, 4 roll planer for first cutting and finishing work.

It takes a good mechanic exercising real skill and taking plenty of time for adjustments to produce first class finished planing on the conventional machine. On the other hand, an average operator will *consistently* produce ideal finished planing on a modern BUSS CABINET SURFACER and maintain tolerances as close as .002 an inch with only about one-third the non-productive time for set-ups and adjustments required on other planers. This is due to the fact that in addition to being built throughout for precision planing, BUSS CABINET SURFACERS are equippd with semi-automatic controls (not available on other machines) which make it easy for the operator to get perfect and almost instant settings. For the greatest production of the kind of planing that saves time on following operations, investigate BUSS CABINET SURFACERS. Write for bulletins. Consult us on any planing problem.

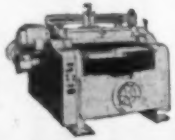
THERE'S A BUSS PLANER TO EXACTLY SUIT YOUR NEEDS

6 MODELS
29 SIZES

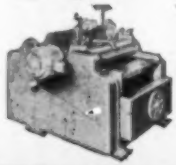
No. 4-L Single Surface, medium sized planer for first cutting and finishing work.



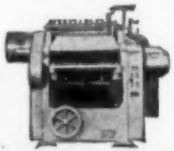
No. 66 Single Surface, 6 roll planer for first cutting and finishing work.



No. 88 Double Surface, 8 roll planer for first cutting and finishing work.



No. 55 Heavy Duty Double Surfacer for planing rough lumber.



MICRO-SURFACER for planing hardboard and other very thin materials.

BUSS
SINCE 1862
MACHINE WORKS

PLANER SPECIALISTS EXCLUSIVELY

234 EIGHTH STREET • HOLLAND, MICHIGAN

See Action Card, page 160. Circle No. 230

WHAT MAKES A FIRE BIG?

Byron J. O'Hara
Vice-president, Buffalo Fire Appliance Corp.

By Byron J. O'Hara

WITH Fire Prevention Week approaching (October 7-13), this should be an appropriate time to consider the problem that fire poses for industry.

Fire plays no favorites and when it strikes it not only damages and maims, but can ruin a company. It is a problem which should be considered by every manufacturing concern, large or small.

How big a problem is fire? Figures give a clear indication.

Every year, between 30,000 and 40,000 fires occur in manufacturing plants alone. This is only a small part of a total figure which the National Fire Protection Association (NFPA) places at 600,000 annually. Naturally, all of these fires are not major. But those that are exact a heavy toll.

In 1955, for example, there were 78 major industrial fires averaging almost $1 million damage in the United States and Canada. And almost every day of the week, there was a fire costing $250,000 or more. The total of such fires was 316, or 6 weekly.

Of the 78 major fires, 40 occurred during daylight hours. The same number started while plants were operating. But more important, 41 of the fires were detected without any major delay. In other words, substantially more than half the major fires last year could have been controlled.

Why, then, were those fires able to spread until they became holocausts? Each year, the NFPA attempts to answer that question in all major industrial fires. Last year, according to "NFPA QUARTERLY", some of the major reasons why fires swept out of control were:

1. Delay In Notifying The Fire Department. In 19 instances, notification of the municipal fire department was seriously delayed. Some building occupants spent too much time fighting the fires before turning in a public alarm. Other delays were caused by burned telephone wires and defective public fire alarm boxes.

2. Lack of Fire Brigades. In 27 cases, losses mounted because there was no

About 1.5 million dollars goes up in flames. Every year, between 30 and 40 thousand fires occur in manufacturing plants.

fire brigade to combat the fire. But 8 brigades were inadequate in other fires simply because they didn't have the proper equipment, or arrived after the fires had grown too big for them to control. On the other hand, trained fire brigades proved their worth by helping to keep damage down in 11 fires.

3. Poor Housekeeping. Rubbish accumulation and bad housekeeping were factors in the spread of 3 fires. It is important to note, however, that in 22 plants flammable liquids contributed to the blaze and that in 11 others dust piles on structural parts aided the rapid spread of the fire. In three other instances, escaping gas helped spread fires.

4. Poor Building Design. The cause of a large share of the losses was laid at the door of building design. In 39 cases, there were areas with too much floor space unbroken by dividing walls. Nine plants, on the other hand had dividing walls but without fire doors. In 5 others, openings for conveyor systems were unprotected.

5. No Sprinklers. In 46 plants, there was no sprinkler system. That the rest of the plants had sprinklers and still suffered heavy damage seems to suggest it isn't safe to rely only on these systems for fire protection.

In eight big fires, the sprinklers were not designed for the particular hazards present. In a number of others, the sprinkler systems were damaged by explosions. Two fires spread because the sprinklers were turned off too soon and in another case, the water had unfortunately been shut off to prevent freezing.

6. Inadequate Vigil. Watchmen were present at 29 of the plants, but 10 of them did not perform their duties satisfactorily. The presence of a watchman had no bearing on the outcome of 12 cases. Only 7 men did a satisfactory job.

A stern warning seems to lie in these

NUMBER OF LARGE LOSS FIRES*

	1955	1954	1953	1952	1951	1950
Manufacturing	78	75	105	88	99	83
Storage	41	54	48	44	50	23
Mercantile	50	54	29	38	49	29
Transportation	70	57	39	48	36	31
Residential	9	11	11	13	8	11
Miscellaneous	68	62	61	44	60	66
Total	316	313	293	275	302	243

*$250,000 or more

causes. Even the plant with the most modern fire protection system available can ill-afford to let its guard down. It may have sprinklers, but are they working? It may have fire brigades, but are they well equipped and manned? It may have many watchmen, but do they know what to do in case of fire?

WHAT CAUSES PLANT FIRES?

Cause	Percent of Total
Electrical Equipment	19
Machine Friction	14
Foreign Substances	12
Exposure To Flame (torches, open gas and oil flames)	9
Smoking & Matches	8
Spontaneous Ignition	8
Exposure To Heat	7
Sparks From Fires (chimneys, burning rubbish, etc.)	6
Overheated Materials	3
Miscellaneous (chemical reactions, static electricity, lightning, etc.)	14

Fire prevention and protection is a never-ending job. The best equipment is of little avail if it isn't properly maintained or if the men who use it are ill-informed.

Because fire is always something that could—but "won't"—happen, the tendency is to relax fire protection vigils. I know of companies which spend great sums for fire fighting equipment and then fail to keep it in good repair. Yet that is of the utmost importance.

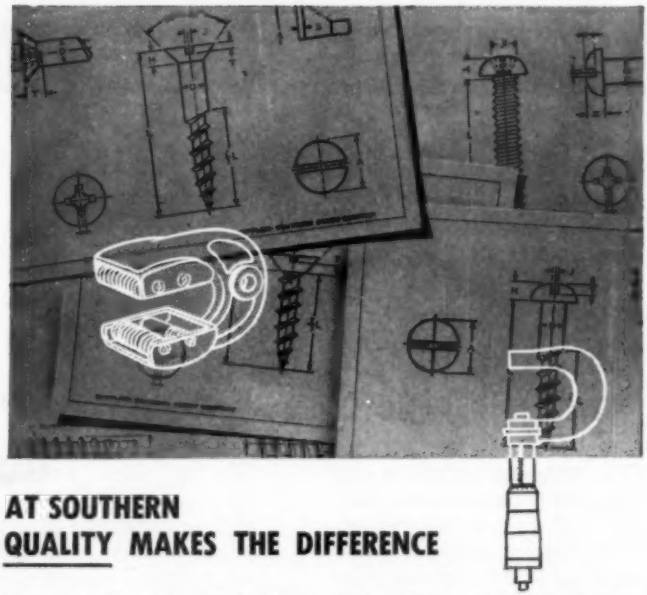
Fire damage—the actual loss resulting from a fire—is really only statistic. The after-effects of fire are just as appalling.

"Kiplinger Magazine," for example, points out that 43% of all severely fire-damaged firms go out of business within a year! Another 28% close their doors within 3 years. Thus, 7 out of every 10 severely fire-damaged companies eventually fail.

An important point to keep in mind is that more than a few major holocausts begin as small fires in remote corners which sometimes cannot be reached by large fire fighting equipment. The best weapons against these fires, says NFPA, are approved portable extinguishers.

A survey made by the Safety Research Institute found that nearly one-third of all recorded fires are snuffed out by hand fire extinguishers before the arrival of the fire department. The survey covered fire department records in 191 cities across the nation. A total of 41,657 fires were recorded and of these, 13, 624 or 32.7% were put out by portable fire extinguishers.

Portable extinguishers are designed to complement other fire fighting equipment such as sprinkler systems and fire brigades. They are the first



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weapons reached for—after the fire department has been notified. They are first aid equipment to be used while the doctor (fire department) is en route to the scene.

In the final analysis, however, there is no such thing as "infallible" protection against fire. There are too many intangibles involved. The proper equipment, properly maintained and utilized is a good assurance that loss in life and property will be kept at a minimum.

Some Books About Wood. Report No. 399, is a list of 60 books on such subjects as forest resources, veneers and plywood, wood chemistry, pulp and paper, and other products and processes. U. S. Forest Products Laboratory, Madison 5, Wisconsin.

TUNGSTEN CARBIDE Applications For Woodworking

By Rex V. Reynolds

Sales Development Engineer, Kennametal Inc.

CEMENTED tungsten carbide is not a steel and has many characteristics that differ greatly from steel, as you can see in Tables I and II on mechanical and physical properties of this material. The logical appraisal of these properties and a desire to utilize them, will put you well on the road to success on any given application. (Please refer to tables to note the coefficient of expansion of steel and carbide.) With such a large contrast as two to one, the possibility of large sections of carbide being brazed successfully to steel is very remote. (See Figure 1 and 2.) Overlooking this fundamental in the early tests contributed to some of the failures of carbide when applied to molders, jointers and planers. Present day usage and continued tests have proved the efficiency of solid carbide knives.

Let us dream a little of ideal conditions where a new machine is designed especially for carbide use:

1. Horsepower and feed rate would be much higher than normal.
2. Grinding and jointing equipment would be precise enough to get the best finish and life from diamond wheels.
3. The feed side of a machine would have magnetic actuated switches or photo-electric eye to stop the machine if large pieces of steel or other foreign objects were on or in the work piece.
4. Wider planers, from 6′ to 8′, would be feasible by using solid tungsten carbide blades with high rigidity.

We could go on dreaming for a long time, but our purpose at the moment is not to build a line of woodworking tools, only to equip them with carbide.

It is not necessary or desirable to arbitrarily junk all of the existing woodworking machinery in order to take advantage of the many benefits offered by tungsten carbide. An old machine, in good state of repair, can make an excellent showing with tungsten carbide if properly applied.

Tungsten carbide tipped saws were one of the first applications to woodworking, and the present success in this field is well know to all. However, in this discussion let us consider the application of solid tungsten carbide to existing straight knife woodworking equip-

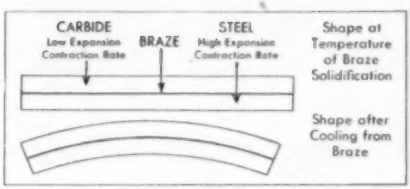

Figure 1.

ment. In this case, factors to consider include alignment, balance, rigidity, cutting angle, etc. We speak of a straight knife, such as planers, jointers, molders and shapers because they offer the greatest potential economic benefits to the most users.

The adaptation of solid tungsten carbide knives is the one basic step that makes today's success possible in contrast to previous carbide knife applications. During the past two years, the carbide industry has developed techniques by which high quality solid carbide knives up to 50" in length have been successfully manufactured and applied. By mechanical holding methods, the carbide knives are strainfree and provide such outstanding performance as to make them economically attractive to practically all users of woodworking equipment.

For a number of years, there has been some contention that carbide knives could not be successfully ground, jointed or maintained in the field. It has also been claimed that the knives would not stand the abuse from lumber having loose knots, glue lines or other normal production defects. I have seen operations which leave no further doubt in my mind as to the acceptance of tungsten carbide by the woodworking industry.

- 50" solid carbide knives jointed and ground with diamond wheels on planers using standard grinding equipment.
- Loose knot red cedar machined with solid carbide knives at 650 f.p.m. without damage to the knives.
- 30" carbide knives jointed at 5400 r.p.m.
- Steel lag screws purposely planed at 3600, 5400 and 7200 r.p.m. without breakage or ill-effect upon the carbide knives.
- Power required per unit of production is reduced when using carbide knives.

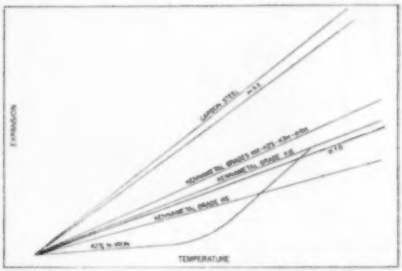

Figure 2.

Installations of Interest

To bring the facts a little closer to home, let me take you step by step, through some outstanding applications in the Northwest:

On the 50" Buss planer at a fiberboard plant, steel knives were reasonably satisfactory on low density fiberboard, even with the necessary 5 hours per day grinding and maintenance time. On a high density board, known as sandalwood, it was almost impossible to get acceptable finish or production. A test was started February 13, 1956, using a set of 50" x 1½" x 5/32" solid K10 carbide knives. The quality, finish and production of all types of board were improved. The feed-rate per minute was increased more than 50%, the noise factor was greatly reduced, the need for daily maintenance was no

MECHANICAL PROPERTIES

Material			Hardness Test Rockwell		Transverse Rupture p.s.i.	Young's Modulus of Elasticity p.s.i.	Compressive Strength p.s.i.	Torsional Strength Shearing Stress p.s.i.
			60 Kgs A	150 Kgs C*	Calculated Beam	Musical Pitch	Crush Tests	Min. Values Reported
KENNAMETAL—TYPE	A	KM	91.0	78.0	300,000	74,000,000	600,000	125,000
		K3H	91.5	79.0	250,000	72,100,000	585,000	100,000
		K5H	93.0	82.0	200,000	73,900,000	640,000	.....
	B	K21	91.0	.....	250,000	70,000,000	646,000	.....
		K2S	91.5	79.0	275,000	80,100,000	705,000	.....
		K4H	92.0	80.0	250,000	79,600,000	650,000	.....
	C	K1	90.0	76.0	325,000	77,900,000	560,000	186,000
		K10	90.5	.....	300,000	.....	.....	.....
		K6	92.0	80.0	250,000	94,300,000	800,000	.....
		K8	92.5	81.0	200,000	90,600,000	675,000	.....
		K11	93.0	.....	175,000	83,000,000	746,000	.....
		KE7	91.5	79.0	250,000	82,300,000	617,000	.....
	D	K82	90.0	76.0	275,000	65,500,000	663,000	.....
		K84	91.0	78.0	300,000	74,000,000	600,000	125,000
		K86	91.5	79.0	250,000	72,000,000	590,000	100,000
	E	K90	85.0	67.0	360,000	61,600,000	518,000	.....
		K91	86.5	70.0	380,000	64,400,000	539,800	.....
		K92	87.5	71.5	385,000	71,900,000	572,000	.....
		K94	90.0	76.0	325,000	77,900,000	600,000	186,000
		K95	90.5	77.0	300,000	82,000,000	644,500	.....
		K96	92.0	80.0	250,000	94,300,000	800,000	.....
STEEL	HSS 18–4–1 Heat-treated		max. 85.0	max. 66.0	.....	32,500,000	600,000	.....
	1.10% C. Heat-treated		max. 83.0	max. 62.0	.....	29,500,000	.....	Est. 60,000 to 116,000
Co., Cr., W. Alloys			83.5 to 85.5	63 to 67	160,000	30,000,000	.....	.....
Brass 60–40 cold-drawn			86.7 B Scale		.....	15,000,000	20,400	.....

Table 1.

longer required. In fact, maintenance was practically eliminated. To speak modestly, the results were exactly as we had expected. Many unseen factors such as metallurgical processing, rigidity, special cutting angle, balance, grinding and jointing, and last but not least, the open cooperation of the user and the carbide manufacturer helped in making this initial application successful. Within a month, the knives listed above had cut 800,000 square feet of hardboard with 1.5 hours of maintenance. With only a few weeks' experience on the operation, this fiberboard company benefited appreciably and justified the initial cost of the carbide knives.

At a laminated beam plant in Oregon, there is an application wherein K-10 tungsten carbide is used in scarfing the planking used in the fabrication of the large laminated trusses and beams which they manufacture. Prior to the adoption of tungsten carbide, this scarfing operation required 16 hours for approximately 5500 scarf cuts. With tungsten carbide, production has now increased to 8500 scarf cuts in 16 hours. This increase in production definitely justifies the use of tungsten carbide, to say nothing of the reduced maintenance.

At a plywood mill in Washington, they are presently using two 16 x 1¼ x 3/16" solid K10 carbide knives which have run 8 weeks on a plywood scarfing job. Steel knives previously used on this job required grinding after 40 hours. The carbide knives ran for an 8-week period and required no maintenance.

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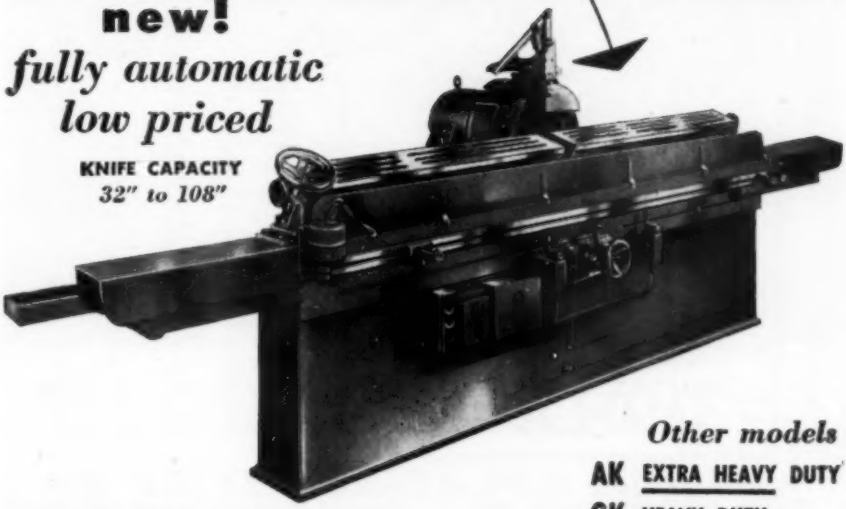

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PHYSICAL PROPERTIES

Material			Specific Gravity gms/cc	Conductivity		Coeff. Thermal Expansion		Magnetic Permeability μ Induction
				Thermal cal/°C/cm/sec.	Electrical % of Copper Standard	$\times 10^{-6}$/°F. Up to 1200°F.	$\times 10^{-6}$/°C. Up to 650°C.	
KENNAMETAL-TYPE	A	KM	11.90	.113	4.7	4.0	7.2	3.0
		K3H	11.10	.068	4.3	3.9	7.0	2.0
		K5H	11.50	.095	4.5	3.6	6.4	. . .
	B	K21	12.65	.105	5.2	3.6	6.4	. . .
		K25	12.90	.136	5.8	3.9	7.0	2.0
		K4H	12.45	.127	5.3	3.7	6.7	2.0
	C	K1	14.10	.147	9.4	3.1	5.5	. . .
		K10	14.40	. . .	. . .	. . .	. . .	. . .
		K6	14.80	.170	7.8	2.5	4.5	1.5
		K8	15.10	.191	5.0	2.5	4.5	. . .
		K11	15.15	.114	5.3	2.7	5.1	. . .
		KE7	14.80	.207	8.0	2.8	5.0	. . .
	D	K82	11.80	.081	5.1	3.5	6.2	. . .
		K84	11.90	.113	4.7	4.0	7.2	3.0
		K86	11.10	.068	4.3	3.9	7.0	2.0
	E	K90	12.90	.106	8.7	3.9	7.1	. . .
		K91	13.41	.182	10.0	3.9	7.1	. . .
		K92	13.81	.110	9.2	3.4	6.1	. . .
		K94	14.10	.147	9.4	3.1	5.5	. . .
		K95	14.60	.156	8.7	3.3	5.9	. . .
		K96	14.80	.170	7.8	2.5	4.5	1.5
STEEL	HSS 18-4-1 Heat-treated		8.6	.061	3.0	7.0	12.6	. . .
	1.10% C. Heat-treated		7.8	.14 (est.)	. . .	8.2	14.7	150-50
Co., Cr., W Alloys			8.38 to 8.76	Low	1.8 . . .	8.0 to 9.4	14.5 to 16.9	Very Low
Brass 60-40 cold-drawn			8.4	.20	. . .	11.6	22.1	1.0

Table 2.

A high production lumber mill in Washington, on February 16, 1956, placed a set of sixteen 13" x 1¼x5/32" K10 knives in the bottom head of a 4-side planer, and have been planing fir and cedar sidings with a minimum of maintenance. Quality has been improved.

Jointing carbide with a diamond stone on these large high speed planers created a minor problem when first tried. However, this was overcome and the answer is typical of problems encountered by carbide application engineers. I believe an explanation of this particular problem would be of interest.

The unwritten law of jointing is to get an end result. (A true cutting circle and a uniform land on each knife). When a jointer bar is set parallel to the head, even with steel knives, the stone is worn out before crossing the complete length of the knife and, consequently, the bar is set so that it angles toward the head, as the stone wears. This procedure is not used in all shops and is generally a setup man's "trick of the trade." When carbide knives were put in the machine (the knives indicated at ± .001 runout) and jointed with a diamond stone, a wide land developed near the end of the bar and was directly proportional to the angle of the bar, thereby jointing the knives to the built-in-error necessary when jointing steel knives.

Jointing with a diamond stone presents some additional problems. You cannot take for granted that the speed of a cutter head to a fixed stone has the same relationship as a diamond grinding wheel to a fixed work piece.

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GARDNER, MASSACHUSETTS, U. S. A.

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Actually, it is one proportional to the r.p.m. of the cutter head, its circumference, and the square-inch surface area of the jointing stone. For example, a 12″ head has approximately three feet of circumference per revolution working against a .25 to .50 square inch area of jointing stone. At 3600 r.p.m., this is about 10,800 surface f.p.m. It is not uncommon to run a diamond wheel at 6000 surface f.p.m., but in this case, the relationship is reversed. Therefore, on large diam. planer-heads such as the Woods and Stetson-Ross, it is not practical to joint at operating speeds with a diamond stone because of the high surface feet per minute. However, jointing can be effective and successful at a reduced rate that will give the diamond stone an opportunity to clean and not load up. This is a situation common to all heads, but particularly true on the larger ones.

The most effective jointing method is to use a diamond wheel on a conventional grinder where a greater surface area of diamond is used for the jointing operation than can be obtained from a jointing stone.

Some may raise objections to the idea of jointing at speeds below the regular operating speed. While I partially concur in your objections, I would like to point out that the increased rigidity of the head containing tungsten carbide blades makes the probability of spring out, or change of the operating plane, quite dissimilar from that which is experienced with steel blades in the same head. In the application on fiberboard of the 50″ blades, the deflection of the head on the high density board was such that the machine vibrated excessively when steel blades were used. However, as soon as the carbide blades were introduced, vibration was practically eliminated.

Tungsten carbide knives are not the only application that is of interest to the woodworking industry. Parts utilizing its high degree of wear-resistance and corrosive-resistance are being applied successfully in pulp and paper mills—debarking nozzles, pump sleeves, band saw guides, and other similar jobs.

Summary

1. Tungsten carbide is not of the steel family and should not be treated as such. Try to effectively utilize its best properties when designing or adapting for your requirements.

2. Hardness, high rigidity, and wear-resistance of tungsten carbide makes possible the economic machinings of wood and wood synthetics that heretofore have not been practical. Basic improvement of the machined product is also possible when using tungsten carbide.

3. Learn and use the best methods of maintaining carbide tools. Diamond jointing and grinding are necessary for maximum performance. Use proper techniques at your plant or set up a maintenance routine with a good service shop.

4. Cooperation between carbide supplier and user is paramount. To obtain the maximum results, a free flow of information regarding end use is necessary. Complete information is necessary for a carbide supplier to give recommendations regarding the best grade, most effective cutting angle, and other pertinent job assistance to your plant.

Mr. Reynolds presented much of this material to a recent A.S.M.E. Meeting. It is reprinted with permission.

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Measuring Air Movement In Dry Kilns

By Paul Graham

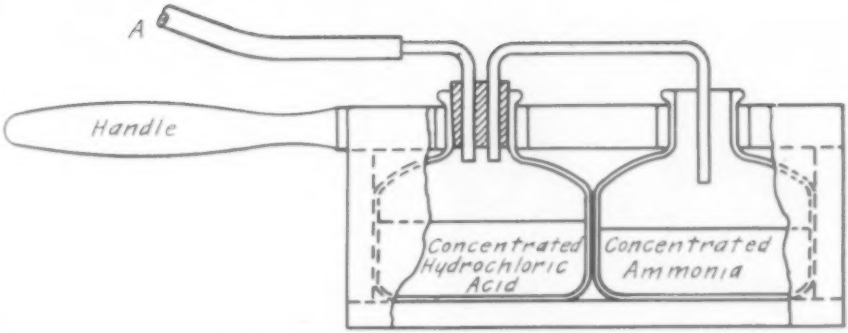
Can dry kiln air movement be measured with sawdust? What is a chemical smoke generator? These and other questions are answered in discussing how to measure air movement. Effective air movement is necessary for efficient, productive dry kiln utilization.

UNIFORMITY of kiln temperatures depends considerably upon uniform air circulation inside of the dry kiln. The rate at which an individual kiln charge of lumber dries is known to vary with the uniformity and velocity of the air circulation, or movement of heated air through the lumber load. Although air circulation refers to all air movement in the kiln, specific reference in regards to the performance of its lumber drying function is made to the rate of air movement through the lumber load.

Air movement in this application functions to carry heat picked up from the major kiln heating source through the lumber load to furnish the energy required to evaporate moisture that is diffused from the center of the boards to their surfaces, and to remove this evaporated moisture from the surface of the lumber out to a point where it can be vented to the outside atmosphere. The rate or air circulation desired is that sufficient to evaporate the moisture as fast as it reaches the surface and to remove it immediately away from the vicinity of the lumber.

Generally speaking, faster air movement is required for drying green lumber or lumber with a moisture content above 25% to 30% than for drying previously air-dried lumber or lumber of a lower moisture content. Arbitrary ranges established for modern forced circulation dry kilns recommend an air movement for drying green or high moisture content lumber somewhere between 200 to 400 f.p.m., and from 100 to 200 f.p.m. for air-dried or low moisture content lumber. Higher air velocity is required when relative humidities are increased to more than 70%.

Authorities seem to agree that under usual operating conditions the rate of drying can be accelerated by increasing air movement through the lumber



Chemical smoke generator used for testing air circulation in dry kilns.

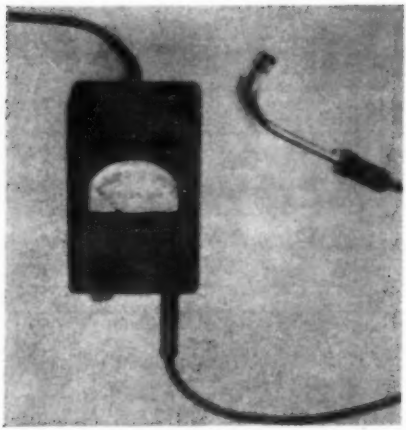
load, and in most cases, the higher the moisture content of the lumber or the higher the temperature, the greater is its effect. Optimum air velocity is limited to some extent by design and operation of the individual dry kiln, drying defects common to some species, size and species of lumber to be dried, and power requirements.

There seems to be a current trend in modern dry kiln design to increase the rate of air circulation. A greater volume of air is being delivered by the fans, without appreciably increasing power requirements, and kiln structures are being widened to materially reduce air pressures against which the fans must operate. Reversible air circulation also provides more uniform drying conditions and increased economy of operation.

Investigation of air circulation rates in current dry kiln operations seemed to indicate that a range of 200 to 250 f.p.m. through the lumber load is considered desirable for most species, with about 300 f.p.m. being considered suitable where reversible circulation was used. In some kiln operations where certain single species were being dried, air velocities were reported to have been stepped up as high as 500 f.p.m.

It is interesting to note that many operators reported uniform air circulation at higher velocities desirable to effect faster drying and better control but usually reached an optimum point of increase where it became more difficult to secure the desired uniformity of air circulation. This point seemed to vary with individual dry kiln design, method of heating, and thickness and species of lumber being dried. Increased air velocities also required more careful stacking of lumber on the kiln trucks. There appeared to be complete agreement that increasing speed of air movement beyond optimum air velocity limits was not as effective as uniform air circulation at lower air movement speeds.

Measurement of air movement in the dry kiln with auxiliary equipment is frequently required to locate causes of non-uniform drying quickly and accurately. The cruder methods and measuring devices used during this period have provided a foundation for modern testing procedures and led to the development and/or borrowing of more accurate instruments from other industry applications which today permit a more scientific approach to precise air movement measurement.



Velometer actuated by air stream entering meter, with impact against vane moving pointer to record air velocity on visual dial.

Reports of early dry kiln circulation tests show that many operators of this period used their handkerchiefs or pieces of cloth to determine direction of air movement. Cloth pennants attached to the end of a pole to permit covering all sections and height levels were also used. Another used a pulley-like flag pole arrangement whereby the pennant could be raised or lowered to desired levels.

One old gentleman who had been operating dry kilns more years than he cared to remember, told of checking air movement in his kilns with a freshly shaven cheek. He claimed to have found that leaving one cheek unshaven increased the sensitivity of the other to air flow. Another oldster recounted the advantages of the use of ostrich plumes, which he claimed to have borrowed from his wife's old hats.

Other operators showed preference for loose materials to measure air flow in the kiln. They tossed sawdust, shavings, feathers or other light materials into the air and followed their drift into the lumber load. No claim was made that these materials functioned properly to determine air movement through the lumber load as they would naturally adhere to the rough surface of the boards.

It was probably this deficiency which first led to the use of smoke for testing air movement. This smoke was usually produced by burning rope, rags, punk, tobacco or some similar slow-burning material in an open receptacle. The fire hazard created by open burning of these materials led eventually to a search for a safer smoke generating device. It was also learned that hot smoke initially given off to the kiln air did not always show the true direction of air movement. The smoke had to cool to the temperature of the kiln air and by which time much of the smoke might be dissipated.

A smoke generating device which was credited to various sources was a chemical smoke generator recommended by the Forest Products Laboratory (FPL Report No. R1900-3). This air movement measuring device became quite popular for kiln circulation testing and is still used by many dry kiln operators to determine rate and direction of air flow in all parts of the kiln.

The device was essentially a handle-rack made of light, thin material designed to hold two small, wide-mouthed bottles (such as ink bottles), about 3′ of ¼″ rubber tubing, 6″ of ¼″ glass tubing bent at both ends to connect both bottles, one or two 3″ glass tubing bent at one end to connect with rubber tubing and bottle, and one or two 2-holed rubber stoppers to fit the bottles.

THE NEW BELL-180

MULTIPLE HEAD MORTISER

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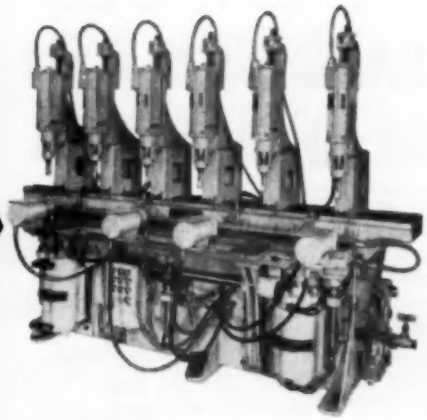
New Accuracies, New Controls, and "Cushioned Power Feed" for Longer Tool Life



You can cut hollow chisel mortises, chain mortises and bore all in one operation or in any of the individual operations—with a "cushioned power" feed that "feels its way" through cuts . . . hurrying on soft cuts . . . slowing slightly on hard cuts . . . to insure accuracy, relieve strain on tools and provide longer tool life.

The New Bell 180 is an advancement of the Multiple Head Mortiser used in Wood Working Plants throughout the world. In addition to the Bell features that made this machine the "Standard of the Industry", the New Bell 180 includes:

- Adjustable pressure 10" air cylinders with controlled air cushion *in both ends* of the cylinder to provide smoother, more accurate, cushioned cutting.
- A complete control panel, incorporating a master stop, set-up button, time delay adjustment, *automatic* or *manual* cycling and individual head buttons *ALL* located at the operator's fingertips and operating from a single 110 volt circuit.
- An air powered table with stroke accurately controlled by a micro switch and adjustable to any pre-set depth.
- Visible air pressure gauges and regulators. Air valves, solenoids and electrical panel safely enclosed within welded steel base.
- Air Clamps for automatic holding of stock, cycled by a micro-switch.

In addition, the Bell 180 is designed vertically to save floor space and allow the material to be worked in a natural horizontal position with working tools and material in plain, unobstructed view of the operator at all times.

To meet special requirements, the Bell No. 180 can be furnished with an extra long table and head carrying beam to allow the addition of head units to meet your demands and expand its usefulness with increased production.

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In some applications only the first bottle was corked and the second bottle was left open. Many operators seem to feel, however, that for best results both bottles should be corked with a glass tube coming out of the second hole in the stopper of the last bottle to better direct the smoke into the lumber load.

A small amount of concentrated hydrochloric acid was put in the first bottle and a similar amount of concentrated ammonia or strong ammonia water was placed in the second. Blowing air through the rubber tubing caused fumes from the two bottles of chemicals to mix and created a cool, dense white chemical smoke which issued from the open mouth of the second bottle or glass tube into the kiln air.

The purpose of this chemical smoke generator was to produce a smoke that would follow the air currents without any tendency of its own to rise or fall and which might be used without danger of fire. Its use made it possible to watch the path of the smoke through the lumber loads and individual portions of a single load to determine uniformity of circulation and causes of non-uniformity such as dead-air zones, pockets or other short circuiting factors which might require correction or compensation.

A similar device designed for improved operator safety added another bottle to the two described above. All three bottles were provided with two-hole stoppers and two lengths of rubber tubing were used, one attached to the first bottle and the other to the last bottle. The additional bottle placed first in line, was empty to make certain that no chemicals or fumes would work back into the operator's mouth. Air was blown through the first length of rubber tubing and smoke emerged from the second.

Hot-wire air meter operates by cooling of hot wire element in probe handle by stream of air, recording velocity in f.p.m. directly on dial.

Chemical smoke generators were often equipped with a rubber syringe bulb in which case the operator expended no energy in blowing through the tubing.

There were other devices of this nature used, some employing a single chemical capable of producing smoke upon exposure to air.

As used to measure air movement in the kiln, the chemical smoke generator was carried throughout the kiln area and held close to the lumber loads while the operator blew clouds of dense white chemical smoke into the various air passages. Where sufficient artificial lighting was installed in the kiln, it was possible to observe the path of the smoke. Since most kilns were not

No. 232

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lighted sufficiently and it was required that all doors be closed and the kiln be operating in a normal manner, it was necessary to use a flashlight to observe the smoke.

While chemical smoke was first used to study general air circulation, it was later used to measure air velocity through the lumber load and is still used for this purpose. This required an assistant at the leaving-air side of the lumber load with a stop watch. The operator signalled when he started blowing smoke into the entering-air side of the load to permit an accurate check to be made. It was common practice to blow the smoke close to the face of the load in its lengthwise direction so that the kiln air stream would pick up the smoke and carry it through the stickered courses.

The assistant started the stop watch at the signal and stopped it when smoke appeared, clocking the time required for the smoke to travel from the entering-air side to the leaving-air side. With the distance between these two points (width of the lumber load) known, it was possible to calculate air velocity with reasonable accuracy.

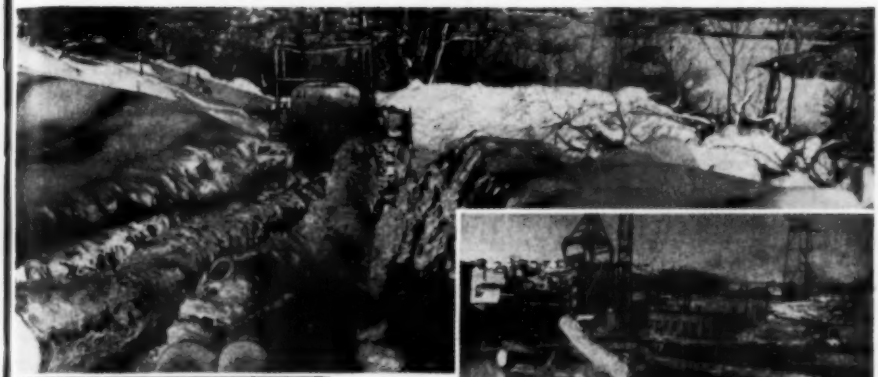
A Canadian kiln operator, trained in England, suggested that a more accurate air velocity calculation by the chemical smoke method is possible when a correction factor is used to compensate for the drag created on the air movement through the load by rough surfaces of the lumber above and below the air chamber. The correction suggested consists of multiplying the maximum air velocity provided by the stop watch check by 5/8.

With the advent of faster circulation of forced circulation dry kilns, smoke tests did not prove to be too reliable or accurate in all applications. Operators began to use anemometers to measure speed and volume of air circulation. These were the conventional fan-type anemometers generally designed to operate with a disc-fan and revolution counter. Many were made so that the fan made one revolution per each foot of air passing, which was indicated by a pointer on a visual dial. A complete revolution of the counter indicated air movement of 100′.

These instruments too required the use of a stop watch. The time the anemometer was exposed to measure the air movement was then divided into the dial reading in number of feet and the quotient obtained represented air velocity in f.p.m.

The instrument had to be in true parallel alignment of its axis with the air movement, and the fan set directly perpendicular to the direction of the air flow. These instruments showed a tendency for incorrect readings when run too fast or too slow, since the speed of the fan was not truly proportional to air velocity over the entire range of the instrument. The instrument manufacturer checked and calibrated the anemometer and furnished a chart with each one showing the correction factor required at different velocities.

Eventually more delicate instruments were developed which still operated on the same basic principles. These instruments registered fast air speeds in the open kiln chamber and measured with equal facility slower air movement in, around and through the lumber loads. They still required the use of a stop watch for calculating air velocity in f.p.m., but claimed to



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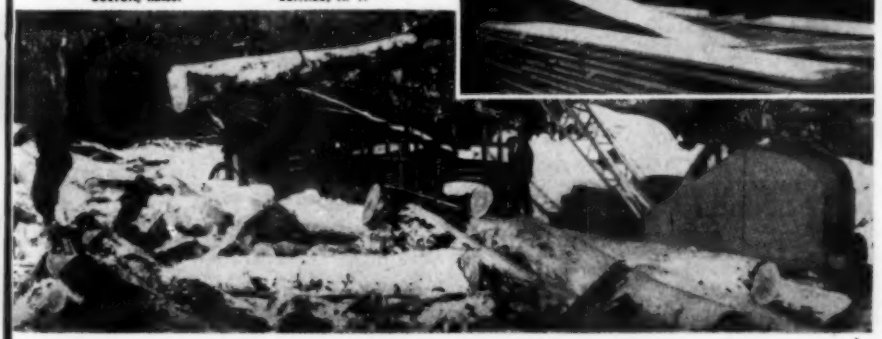

See Action Card, page 160. Circle No. 237

FloRite bridled vane anemometer furnished with detachable handle. Velocity is measured by holding instrument against air flow. Air current blows directly against circular opening.

measure air movement as slow as 30 f.p.m. and to show only slight error in measuring air velocities as low as 15 f.p.m.

A typical modern instrument of this type is the bridled vane anemometer. In its operation air velocity is determined by impact pressure of the air stream against a multi-vaned rotor assembled in a die-cast housing. The shape of rotor blades and mounting of the rotor assembly are designed for true response to the impinged air velocity in all positions. A spiral spring restrains the rotation of the vaned rotor, and one revolution of the rotor represents the maximum air velocity for which the instrument is calibrated.

Angular displacement of the rotor (torque) is proportional to velocity of the air stream blowing against the instrument at the instant of measurement. This torque is directly indicated, in f.p.m. on a scale attached to the periphery of the rotor. Velocity of air movement is measured by holding the instrument squarely against the air flow in such a manner that air currents blow directly against a circular opening in the instrument.

A scale lock is provided which permits the scale reading to be retained until released to give an accurate reading. A stop watch is still required to record time.

Hot wire air meters and thermo-anemometers were reported to be first used for measuring air movement during the 1920's. The first mention of hot wire anemometers was about 1914. Hot wire speed and direction meters were mentioned as being used in 1921 and 1922. Principle of operation depended upon the cooling of electrically heated wire in an air stream, marked by slow speed sensitivity, to indicate air velocity. Some trouble was encountered in these first instruments with convectional currents of their own. The elaborate apparatus and manipulation required also detracted somewhat from their usefulness.

Similar instruments were later developed which were less complicated and of superior design. In 1938 considerable publicity was given to a new heated thermometer-anemometer. This instrument was described as a heated thermometer-anemometer with many desirable characteristics of conventional hot wire instruments, but with capacity to measure a wide range of air velocities.

Principle of operation was based on a heated bulb of an accurate glass thermometer being surrounded by a man-

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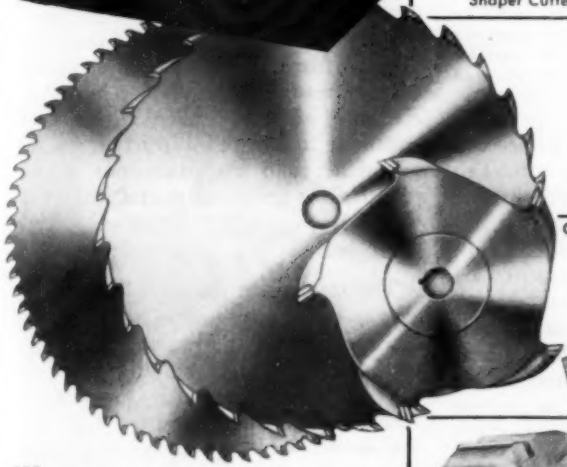

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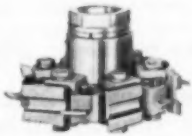
Shaper Cutters

Router Bits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High Speed
Steel Knives

Solid Carbide
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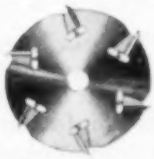
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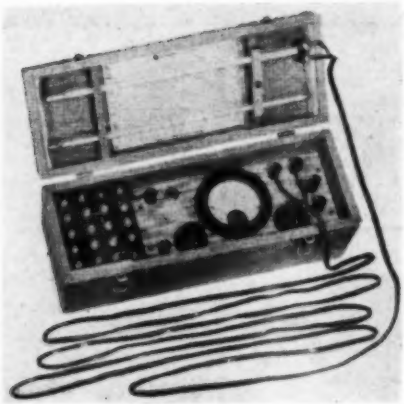


Wilson thermo-anemometer operates with fine wire coil sealed into one of two matched thermometers. Electrically heated at constant voltage from batteries, rheostats are adjusted by a voltmeter.

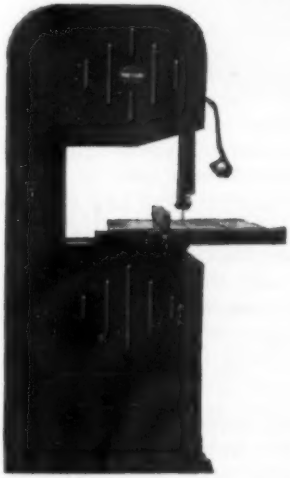
ganin wire heating coil which cooled off when exposed to air currents. The extent of cooling, as indicated by the difference in temperature of heated and unheated thermometers, varied with air velocity and could be measured by varying operating voltage. Temperature shown by the heated thermometer was said to depend upon: electrical heat input to the heating coil; ambient air temperature; and velocity of air current to which it is exposed.

The basic instrument consisted of an ordinary glass thermometer with an electric coil surrounding its bulb. Apparatus for controlling electrical heat input consisted of: small dry cells or other source of electricity suitable; a voltmeter for measuring the voltage applied to the heating elements; two wire-wound rheostats in parallel for regulating the voltage; and a control thermometer. Velocity was read off a chart or computed from an equation similar to that used by King for the hot wire anemometer and Hill for the kata-thermometer. Where the chart was used, the operator subtracted the unheated from the heated thermometer temperature and read the velocity off the chart corresponding to the temperature difference and the voltage used.

A modern thermo-anemometer developed from the original heated thermometer-anemometer operates with a fine wire coil sealed into one of two matched thermometers. When this is electrically heated at constant voltages from batteries and rheostats, passing air reduces the temperature difference between the heated and cold thermometers. The air velocity is obtained directly from this temperature difference by reading a calibrated chart. Direction of air flow is claimed not to be required; airstream obstruction to be negligible; and no corrections to be required for temperature and humidity variation or ordinary variations of radiant heat.

The instrument assembled in a light case is said to weigh only 6 lbs. The binding posts of the heated thermometer are connected to binding posts on the instrument panel by means of electric cord. The bulb of the heated thermometer is located in the air stream. Voltage is adjusted to the value indicated by the chart for various air velocities (value to give temperature difference of 15° to 30°). Current raises the heated thermometer to equilibrium (usually taking about 5 minutes for air velocities under 100 f.p.m. or ½ to 1½ minutes for higher velocities). The reading is taken and temperature of the air in the vicinity of the heated thermometer is obtained with a control thermometer so that temperature difference may be chucked. Knowing the

POWERMATIC'S MODEL 80 20" BANDSAW



Constructed of steel plate, braced heavily to give maximum rigidity. All moving parts completely guarded. Top and bottom wheels easily accessible through hinged doors on front of saw. The lower wheel is equipped with a foot brake that is convenient to operator. Sealed dust chute keeps motor and pulley free from cuttings and dust.

SPECIFICATIONS

Table size	24"x24"	Table tilt right	45°	Blade speed	4500
Wheel size	20"x1¼"	Table tilt left	12°	Floor space req.	41"x29"
Blade to inside col.	19½"	Max. width of blade	1"	Wt. less motor	660 lbs.
Height under top guard	13½"	Length of blade	139"	Wt. domestic crated	775 lbs.
Table height from floor	41½"	Overall height	76"		

POWERMATIC MACHINE COMPANY
McMINNVILLE, TENNESSEE

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voltage and temperature difference, velocity of air movement may be obtained by direct reference to the chart furnished with the instrument.

Modern hot-wire air meters are generally more popular than the thermo-anemometers. These instruments are quite simple in construction, design and operation. They indicate air velocities directly on a visual scale in f.p.m. when the heated wire element is held in the air stream, and are equipped with convenient probe-type shielding tubes to permit safe and easy handling. As with instruments previously mentioned, their operation depends upon the cooling of a hot wire by a stream of air. Readings are usually made at the leaving-air side of the lumber loads.

It was not possible to determine just when velometers first began to be used to measure air movement in dry kilns. Their evident popularity seems to result from the fact that they provide instantaneous, direct readings of air velocity in f.p.m. without timing, calculations, or reference to tables or charts.

Velometers are generally of two types: one designed to measure air entering the instrument through a shutter or screened opening; the other, using a port or tube-connected jet. Air is usually discharged through a port on the opposite side of the instrument. Readings register on a visual scale mounted in the instrument case calibrated in velocity f.p.m. Manufacturers advise that the shutter or screened-opening type is best suited for low range air velocity readings, and the port or tube-connected types for high range readings. Double range velometers are also supplied for all-purpose air movement testing. Triple-range instruments are also manufactured, but these have much greater velocity capacity than is required for dry kiln use, with a high range scale up to 24,000 f.p.m.

Most of these instruments are supplied with a dust filter attachment and special jets which are individually calibrated to meet velocity measurement requirements. For special applications, tube attachment fittings are sometimes required. The double range instrument usually provides a low range down to 10 or 20 f.p.m., and a high range up to maximum scale. This can run as high as 10,000 f.p.m. Correction may be required for air temperatures above 120°F., or relative humidity above 50%.

The velometer is actuated by the impact of air entering the meter, when either the meter or separate jet is held in the air stream. A typical velometer movement comprises a vane to which a pointer is attached, with hair springs for control, in a double-pivoted, double-jeweled movement. Operating parts and visual scale are housed in a convenient, light carrying case. A manual zero adjusting screw is usually provided to permit turning the pointer back to zero in case of accidental shifting.

In a typical application the jet connection of the instrument is held between stickered course openings on the leaving-air side of the lumber load. The velocity read directly on the scale shows flow of air passing through the load in f.p.m. To arrive at an over-all velocity figure, readings are made at several places in the load from top to bottom. Few operators attempt to take reading with kiln heat turned on full, as the instrument is held by the operator, but it is generally felt that the small error induced by measuring air velocity in the kiln in cooler air is negligible.

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In general, efficiency of the velometer calibrated with accurate standards is said to be about 3% of full scale reading. It is possible, however, to obtain special calibration and accuracy reports where more precise readings are required.

Measurement of air movement with auxiliary dry kiln equipment discloses causes of non-uniform or insufficient air circulation which are not possible to locate by other means of examination and does so more quickly, accurately and thoroughly. It also simplifies the problem of calculating volume of air required for drying, which involves consideration of air circulation, drying rate and temperature drop.

It may point up the effect of air velocity on the drying lag across the load. It may disclose improper stacking of lumber for drying which is causing short circuits or dead-air pockets, or circulation tests may show the need for baffling to force the air to travel where it needs to go for uniform drying. On the other hand, troublesome shrinkage may be found to be due to too rapid evaporation. Measurement of air movement through the loads may signal the need for reversible circulation, or the need for booster or reheating coils in a double-track kiln.

Mention has been made of the various limitations on optimum air velocity in the kiln. Increased power consumption is always a limiting factor, but increase of air velocity is also limited to a great extent by drying defects found in some species and species and size of lumber being dried. Many operators contacted on this subject seem to feel that this is best determined by studying the individual kiln operation. Admitting that it is practically impossible to properly dry all species and thicknesses of lumber at the same rate of air circulation, these men contend that it is possible to arrive at an average rate of air circulation which will compensate for many drying variables by basing it upon the requirements of species and thicknesses dried with greatest frequency and in the largest volume. Some advised that proper baffling can be made to adjust air circulation to suit requirements of individual charges.

The use of auxiliary dry kiln equipment to measure air movement is a valuable aid to efficient operation of external blower or duct-type kilns whose temperature distribution depends more on air circulation than volume or distribution of heat radiating surface. Uniform air delivery must be obtained along the length of this type of kiln for required uniformity of drying.

As a result of combined air movement and longitudinal temperature tests made in this type of a dry kiln, it was possible to provide the desired uniformity by increasing the area of air inlet slots in cold zones and decreasing those in hot zones.

It is just as important to check the operation of the dry kiln as it is to have an automobile checked and overhauled periodically. Continuous operation of either the automobile or the lumber drying machine is bound to create wear and to produce faults which will shorten operating life and reduce efficiency unless properly maintained. In auxiliary dry kiln equipment the operator can find the means of trouble-detection but he must supply the will to use them. Beyond that, he must learn how to use this equipment properly to produce desired results.

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National Safety Congress And Exposition Chicago, October 22-26, 1956

EVERY effort has been made to develop a program of subjects designed to meet the needs of the wood products manufacturer. The Wood Products Section will have a variety of subject matter which will be discussed by top-flight speakers. Here are the program highlights.

Monday, October 22

"Top Management Looks at Wood Products Safety"
—J. W. McNutt, president, William Milne Lumber Co., North Bay, Ontario.

"Don't Bet Your Life"
—Clyde R. Powell, Director of Public Relations, Lehigh Safety Shoe Co.

Tuesday, October 23

"The Human Element & Safety in the Wood Products Industry"
—Dr. Leon Brody, Director of Research Center for Safety Education.

"Effective Methods of Accident Prevention"
—Panel Discussion.

Wednesday, October 24

"Tools Used in Safety Programs"
—Robert Gray, Safety Director, Union Bag and Paper Corp.

"Top Management Support" (Demonstration with slides and recordings.)
—Robert M. Gilmore, General Chairman, Wood Products Section, N.S.C.

"Low Voltage Hazards, A Problem in the Wood Products Industry"
—J. F. Rithmiller, Safety Engineer, Lumbermens Mutual Casualty Co.

Thursday, October 25

"The Gyppo Logger Speaks"
—Speaker to be announced.

"The Job Ahead in Industrial Accident Prevention"
—Robert M. Evenden, Safety Manager, Guy F. Atkinson Co.

"Felling & Bucking" (Film on techniques in use of the power chain saw.)
—E. T. Clark, Pacific Northwest Loggers Association

Latest safety equipment will be displayed by a number of exhibitors. National Safety Council staff members will be on hand for additional help with your particular problems. The four-day program promises to be filled with up-to-date, practical information for every manufacturer interested in safety. Convention and exposition will be headquartered at the Conrad Hilton Hotel.

Contact the National Safety Council, 425 N. Michigan Ave., Chicago 11, Illinois, for additional details and information on the convention.

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The precision teeth in HOE Carbide Tipped Saws insure perfect balance – faster cutting (which means more production) and longer life (which results in lower operating costs). All steels and carbides used in HOE saws are specially selected and held under rigid quality control. New furnace and tempering system assures superior quality and performance. Highly polished faces and sides mean smoother, cleaner cuts. Select your needs from list below. Special bulletins on any item available on request.

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See Action Card, page 160. Circle No. 242

Eliminate arcing and burning from your electronic wood bonding operation

THERMATRON

Automatic Electronic

your electronic wood bonding operation

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Automatic Electronic

ARC SUPPRESSOR*

Type AS-3W

Saves costly electrodes and materials by anticipating any arc before damage occurs. Spoilage and expensive down-time are reduced to a bare minimum with this compact new arc suppressor with microsecond response. It detects when arcing is about to happen and cuts off the power instantly. A buzzer and flasher light indicate that the unit has functioned — then the electronic generator is recycled for the next operation.

The new Arc Suppressor, boon to thousands of Thermatron welding installations in the plastics field, is now available to the entire woodworking industry. Developed by Thermatron engineers as another step toward trouble-free electronic gluing, it affords maximum protection and is designed for installation on any RF generator.

Thermatron engineers will gladly tell you more about this latest refinement in electronic bonding . . . Write for complete details to Dept. WD-59

Would you also like information on electronic bonding equipment for your particular requirements? There are Thermatron generators and presses large and small for every purpose.

*PAT. PENDING

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BOX MANUFACTURER DISCOVERS SAFETY PAYS BIG DIVIDENDS

Wisconsin box company proves in dollars and cents that safety is necessary for efficient, profitable plant operation. Lower insurance rates, higher cash dividends and a more productive employee group resulted from this safety program.

FIVE years ago, the employees of a large Wisconsin box manufacturing plant were suffering disabling injuries at the rate of 40.2 for each million man hours worked. Late in the spring of 1956, this same plant—operating with essentially the same employees—completed a string of 438 successive days in which not a single lost-time accident took place. On the old basis, at least 13 accidents would have taken place in this time!

This seemingly miraculous conversion wasn't brought about by a magician or a wonder-working "Superman." Instead, it required long hours of careful planning and imaginative execution on the part of the management personnel of the Marinette and Menominee Box Company. Their success story also demanded a substantial capital investment and it is significant that the officials at M & M Box Company look on these expenditures in these terms.

An investment implies the hope of future dividends—either in the form of money or some intangible satisfaction. Up in Marinette, Wis., they are enjoying returns of both kinds. First, there are the bonuses that cannot be accurately measured: the boost in employee morale that comes with successful accident prevention; the continuity of shifts and crews that long accident-free stretches permit; the steady and uninterrupted flow of production and the very real satisfaction to management and employees alike

For a safety program to function smoothly, someone must coordinate its activities. Safety committees have proved their value. Part of such a committee's responsibility is to study the latest in safety equipment, make recommendations to management and sell other employees on the wisdom of using protective devices.

of seeing a tough problem licked. But there is more! In 1950 M & M Box was operating on a 5.5 per cent debit on its workmen's compensation insurance rates. Last year, (1955), they enjoyed a 16.8 per cent credit—and chances are better than good that their rating is in for another improvement during 1956.

Put another way, this means that, where the company had been paying a premium 5.5% above their industry's average, they are now paying 16.8% less than those box manufacturers whose accident frequency rate is "normal." That is a decrease of 22% and is the dollars and cents proof that sound accident prevention can become a money making proposition.

The principal ingredients which were combined to produce this success are: employee education, pre-employment physical examinations, better "housekeeping" both in and out of the plant, and a modern program of machine guarding. These controls were developed by officials of the box company with the assistance of accident prevention specialists from their insurance company, Employers Mutuals of Wausau.

Until management is able to convince its employees that it is serious about accident prevention, it is extremely difficult for any effort toward accident reduction to be effective. M & M officials realized this situation and put employee education and morale at

Contrast in the lumber yard before and after entire area was resurfaced. Note the poor house keeping in the first picture and uneven terrain—all inviting accidents to happen.

the head of the list things that had to be done.

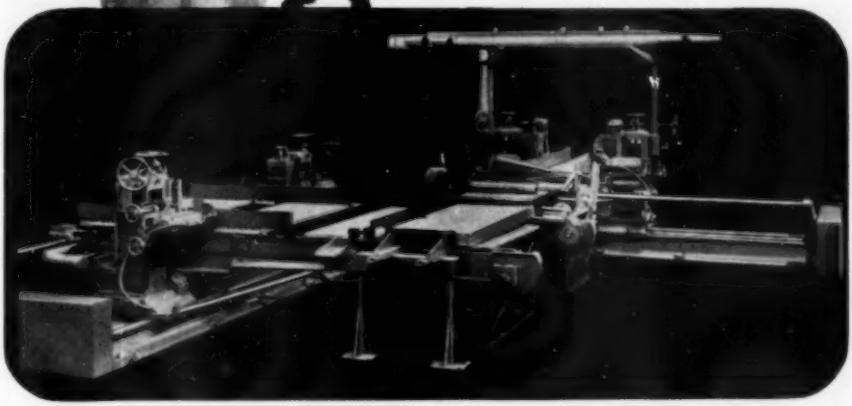
When a new office building was erected several years ago, the old building was completely remodeled to include a large meeting room, a kitchen and a recreation room. This was turned over to the employees for their own use, and also as a meeting place for the safety committee which M & M was trying to re-activate. The shot in the arm to employee morale was tremendous: assignment to the safety committee soon came to be sought rather than shunned. Every worker took new pride in his company and his job. All became actively interested in safety, and wanted to learn more about it and were ready to go along with the recommendations that came from management and the insurance company.

This was a step—a mighty big one—in the right direction, but much still remained to be done. The "attitude for

Mechanized lift trucks such as this one speed transporting and stacking of lumber safely. Use of vehicles of this type was one in the series of safety improvements made at M & M Box Company. Note hard hats.

UP TO 8 DOORS PER MINUTE

automatically sized, eased, and cut off



. . . using Greenlee No. 542 Door Machines equipped with an automatic transfer unit

V-chain tracks on the GREENLEE No. 542 are machined of special non-metallic material to eliminate lubrication and wear problems while assuring cutting accuracy. Top easing units float on guide rollers to automatically compensate for varying door thicknesses. Special chip removal system in transfer unit prevents marring of doors in the hopper or under the rollers.

GREENLEE

With this GREENLEE assembly in your plant you can automatically size, ease, and cut off nearly 500 doors an hour! Doors are first fed into the GREENLEE No. 542, shown at right above, for sizing to width and easing edges. GREENLEE Transfer Equipment then automatically conveys the work to the adjacent GREENLEE No. 542 for cutting off to length . . . eliminates need for two men normally required at this handling point. End result is high-speed production *on a most accurate basis* to put your plant in an outstanding position for meeting today's highly competitive conditions. Write for details.

GREENLEE BROS. & CO., 1870 TWENTIETH AVE., ROCKFORD, ILL.

See Action Card, page 160. Circle No. 244

Officials and members of M & M Box Company's safety committee receive a plant safety award from their compensation insurance carrier, Employers Mutuals of Wausau—the first ever awarded to the company

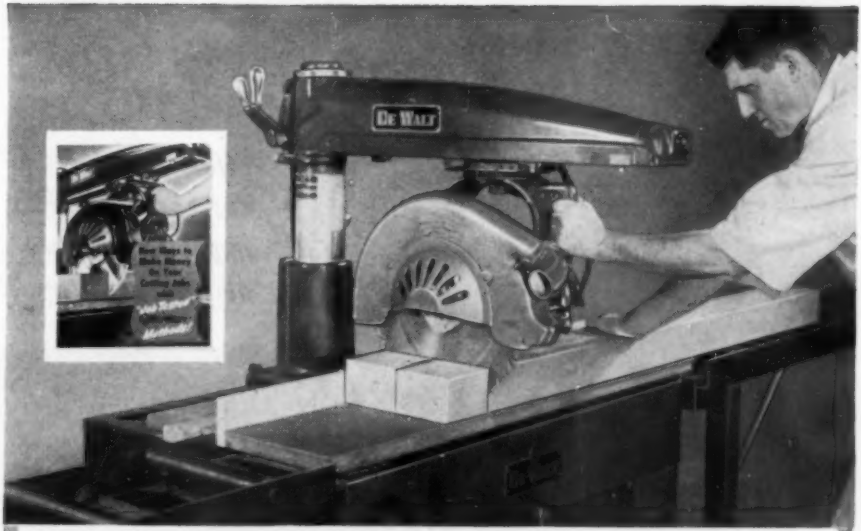
safety" had been established all long the line from management to supervisors to foremen and finally to the workers in the plant. Now was the time for introducing the physical aids which would assure M & M employees of a safer plant in which to work.

At about this same time, M & M Box Company, through the efforts of its president, Daniel Coffey, joined the Wisconsin Council of Safety and began to take an active part in its activities. Through this medium and the guidance of Employers Mutuals' accident prevention specialists, a system of controls was outlined and rapidly put into effect. Pre-employment physical examinations were undertaken to assure that each new M & M employee was physically capable of doing the kind of work assigned to him and that there were no apparent infirmities which might lead to serious injury.

And things were beginning to happen in and out of the plant, too! Housekeeping was made the watchword of the day and it was in this phase of activity that the company made its most significant financial contribution toward an improved safety record. The entire lumber yard was resurfaced—an expensive action, but one which eliminated a very real dust hazard as well as the obvious dangers that existed in moving materials across rough and uneven terrain into the plant. At the same time, a fork lift truck was purchased which greatly reduced the chance to possible injury of employees engaged in bringing raw material into the main plant.

With a neat and modern lumber yard now at hand, the company proceeded to unitize all of its lumber, completely eliminating a somewhat unsightly, and highly dangerous condition that had existed in the past. Insurance company representatives are quick to point out that now M & M's yard is one of the most modern in the state.

Inside the plant, machines and saws were equipped with the latest approved



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See Action Card, page 160. Circle No. 245

"How can we cut costs and improve quality at the same time?"

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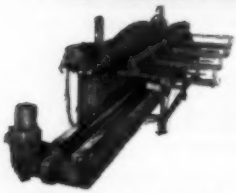
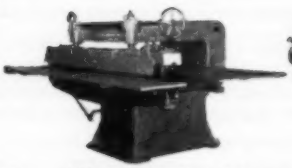
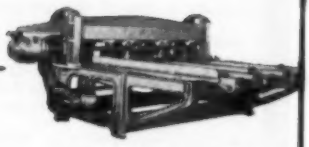
WOODWORKING M



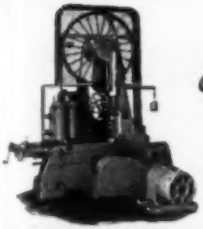
VENEER JOINTER — Traveling head eliminates shifting. No chain feed, no stock wobble. Perfectly joints bundles of veneer up to four inches thick. Sizes from 90" to 212". *Described in M-J Jointer Bulletin.*



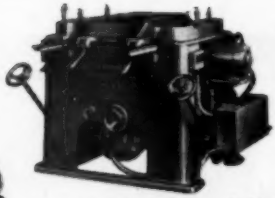
VENEER SPLICER—Makes precision tapeless joints. Adjusts automatically for varying thicknesses of veneer. Welded steel frame with 49" throat clearance at right. *Bulletin No. 50.*



No. 435-H MULTIPLE CUT-OF SAW—Cuts long boards in short pieces . . . square cu large sheets . . . cuts any nu ber of grooves. An excelle plywood sizer. *Described in M Bulletin No. 435-H.*

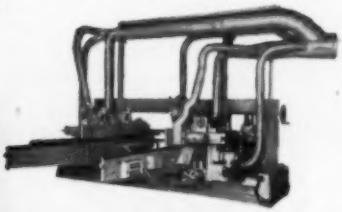


VERTICAL BAND RESAW—Eight feed rolls eliminate stock wobble. 54" Twin Band Resaw. Combination band, rip resaw. Sizes 48" to 60". *Described in Resaw Bulletin.*

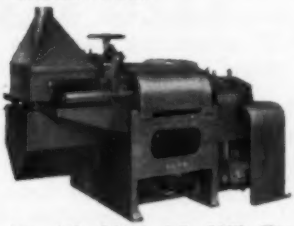


No. 326 MATCHER JOINTER—For sash and door, furniture, box factories and many special applications. Adaptable for jointing hogshead staves. Unequalled for "T" and "G" work. *Bulletin No. 326.*

No. 442-MT COMBINATION SAW—Versatile machine for ripping, cross cutting, grooving, dadoing, beveling, mitering. Cuts up to 48" wide and rips up to 50" wide. Handles large stock easily. *Described in Bulletin No. 442-MT.*



No. 400 DOUBLE-END TENONER—Sizes up to 20' to fit your requirements. Will square-cut up to 96" ahead of trim saws. Accessories expand its usefulness. *Described in Bulletin No. 400.*



No. 441 GANG RIP SAW—For highest production on the toughest gang ripping jobs. Six power driven feed rolls—12", 19", 24" saw spacing . . . up to 125 HP . . . variable feed drive up to 300 FPM . . . glue joint accuracy. *Described in M-J Bulletin No. 441.*

No. 477 CUT-OFF SAW—Capacity equals two or three swing, straight line or roller carriage cut-off saws depending on type and condition of stock. Excellent for box work. *Bulletin No. 477.*

No. 600 DOUBLE CUT-OFF SAW—Accurate production at high feeding rates. Time and labor saving attachments include cope motors, dado arbors and other devices for specific needs. Larger sizes available. *Described in Bulletin No. 600.*

EN JOHNSON
NG MACHINERY

See Action Card, page 160. Circle No. 246

guarding devices and the operators carefully instructed in how these protective devices were to be used. Safety shoes and safety goggles—in which the company shared the cost—began to make an appearance. Today, every plant employee who is exposed to dangers of falling objects or flying particles, is equipped with the finest safety devices that can be obtained.

Recently, when the subject of industrial noise began to be a matter of primary concern to businesses of all kinds throughout the country, M & M Box was among the first establishments in its area to begin a systematic program to eliminate noise wherever possible—and to reduce it everywhere else. The company began by joining with other employers in Marinette and Menominee in establishing a pre-employment hearing clinic, through which pass all prospective employees in the two cities.

The program has a two-fold purpose. First, to help persons who have a slight hearing loss to understand their condition (statistics reveal that a majority of those with a "moderate" loss are completely unaware of the fact;) and second, to avoid the possibility of putting unusually noise-sensitive persons on jobs where their hearing might be adversely affected.

With the help of hearing conservation specialists from the insurance company, a series of noise level surveys was made in the plant to learn which areas were in the greatest need of attention. These situations will be dealt with in a number of ways. In one instance, a noisy planing operation will be moved into a separate building, reducing exposure from the entire working force, to four or five men. In others, sound resistant materials will be employed to deaden the noise and in those cases which will require more intensive examination, employees will be equipped with ear plugs until a final solution can be discovered.

The box company has come a long way in the last five years. The statistics tell the story in as graphic a manner as possible. But the trend toward safety at Marinette is evident even to a total stranger visiting the plant for the first time. Outside the main entrance is a large sign which loudly proclaims: "This plant has gone (—) days without a lost-time accident." And every employee in the plant and in the office from President Coffey to the night watchman, can tell you at the close of the day, what number will be posted the next morning.

The sign might well be changed to read: "Be careful—safety minded men at work here."

"I just hired a real find—an employee who doesn't drink coffee!"

Extra-smooth finish and proper balance distinguish these HIDDEN POWER wood clubs that are made of specially impregnated wood, and bonded with PENACOLITE adhesives.

Wood Golf Club Heads Bonded with PENACOLITE® Adhesives to *TAKE ROUGHEST USE!*

Longer shots and greater accuracy are just two of the many advantages claimed by Albert S. Liebers Co., Inc., of New York City, for these Hidden Power Golf Clubs.

Three sections of densified-birch-wood laminations are bonded together with PENACOLITE adhesives to produce each rugged club head that will withstand the roughness of tournament play or beginner use, and give greater resiliency upon impact with the ball.

PENACOLITE adhesives were chosen for this critical bonding job because they are formulated to take the severest use and abuse. Completely waterproof, PENACOLITE bonds remain as strong as the woods they join, even though soaked in water indefinitely. They are unaffected by extreme heat, cold or dryness. They resist the shrinking and swelling of wood, and will not deteriorate with age or long exposure.

It will pay you to consider PENACOLITE adhesives for your particular wood bonding job. Send for our free, illustrated booklet describing their many advantages and great variety of uses. Koppers Company, Inc., Dept. WD-106, Chemical Division, Pittsburgh 19, Pennsylvania.

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The original waterproof room-temperature-setting adhesives

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In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario

See Action Card, page 160. Circle No. 247

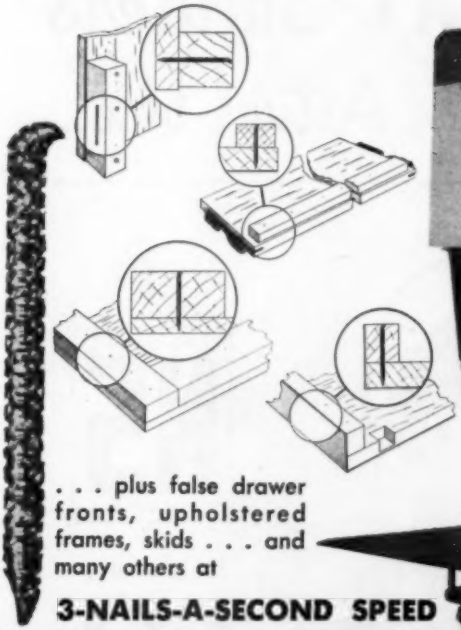
DATA FILE
COMMON COMMERCIAL WOODS

Name	Class*	Workability	Weight†	Utilizations
Alaska Cedar	S	Easy	31	Splits easily, soft and brittle. Cabinetwork, boats, doors, and trim.
American Chestnut	H	Easy	30	Interior trim. Fence posts, fuel, furniture, pulpwood.
American Elm	H	Fair	33	Hoops, staves, furniture, flooring, sporting goods.
Holly	S	Fair	36	Scrollwork, turnings, small musical instruments, cabinetwork.
Atlantic Whitecedar	S	Easy	23	Siding, shingles, boats, tubs, pails, telephone posts.
Balsam Fir	S	Fair	25	Framing, trim and cabinetwork.
Balsam Poplar	H	Easy	23	Veneer for fruit baskets, pulpwood, boxes.
Basswood	H	Easy	26	Venetian blinds, cheap furniture. Has lustrous finish.
Beech	H	Hard	45	Interior trim, woodenware. Tough, stains evenly.
Bigleaf Maple	H	Fair	34	Furniture, interior finish, flooring, broom handles.
Black Cherry	H	Hard	35	Patterns, small articles, carvings. Very tough.
Black Gum	H	Fair	35	Not widely used. Veneer, furniture, trim. Uniform texture.
Black Locust	H	Hard	48	Fence posts, turning stock. Hard and durable; needs filler for painting.
Black Oak	H	Hard	43	Cheap furniture, cooperage, flooring, fuel.
Black Tupelo	H	Fair	35	Flooring, rollers in glass factories, hatters' blocks, pistol grips and gunstocks.
Black Walnut	H	Fair	38	Very important for fine furniture, veneers and cabinetwork. Rich color and distinctive figure.
Butternut	H	Easy	27	Veneer, inlay, small carvings and furniture. Soft and weak; takes paint well.
California Incensecedar	S	Easy	25	Fence posts, railroad ties, cedar chests, door and window frames.

*Denotes hard or soft wood.

†Pounds per cubic foot of air dry wood.

CUT COST AND IMPROVE APPEARANCE ON:



. . . plus false drawer fronts, upholstered frames, skids . . . and many others at

3-NAILS-A-SECOND SPEED

WORKING RANGE OF AUTO-NAILERS

MODEL	NAILS Length	NAILS Gage	WORK AREA Height	WORK AREA Depth
Crusader—2	¼ to 1"	18-19-20	9¾"	2¾"
Mercury—3	¼ to 1¼"	17-18-19	9¾"	2¾"
Spartan—4	¼ to 1½"	15-16-18	35"	12½"
Trojan—5	¼ to 1¾"	15-16-17	14½"	8½"
Hercules—9	½ to 2¾"	13-15	32½"	15½"

Write for free Catalog

Controlled depth drive; controlled countersink; makes its own nails in accurate lengths up to 2¾ inches.
Three types of nailing . . . plain, brad, clinch. Auto-Nailer will also start nails for later hand-driving.
Hurricane drive eliminates splitting. Auto-Nailer nails stay put—won't back out.

NEW HERCULES — 9

AUTO-NAILER

AUTO-NAILER CO., 269 Marietta St., N.W., Atlanta 13, Georgia

See Action Card, page 160. Circle No. 248

NATIONAL Sanders
Proved Best in Actual Use...

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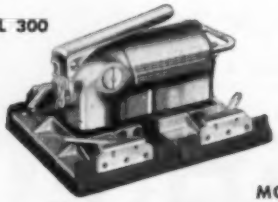
MODEL
400

Over one hundred thousand Model 400 National Air Sanders are in use in industries throughout the nation. Their abilities to cut finishing costs, and still give a better sanding job is proven by their continued popularity. National makes a complete line of block sanders for the woodworking industry . . . electric or air driven with either orbital or straight-line action. Write today for a complete catalog.

MODEL 600

MODEL 300



MODEL 500

NATIONAL AIR SANDER, INC., ROCKFORD, ILLINOIS

See Action Card, page 160. Circle No. 249

FINISHING SECTION

Processes in Force Drying Wood Finishes

Finishing Clinic

Safe Practices For Sanding Machine Operators

FORCE DRYING PROCESSES

Fourth in a series of articles on the highlights of Furniture Finishing Short Courses conducted by North Carolina State College, Raleigh, North Carolina, and the Southern Furniture Manufacturers Association, High Point, North Carolina.

By

Roy M. Carter

Professor of Wood Technology
North Carolina State College
School of Forestry

CONDITIONS in drying ovens most favorable for rapid curing or drying of wood finishing materials also dry the wood. As wood dries it shrinks, sometimes causing surface checks in the exposed wood surfaces, open joints, glue failure and other dimensional changes. When such defects are found during or immediately after finishing they are generally caused either by improper drying or by lack of humidity control in the drying ovens.

Wood surfaces, unfinished, partially finished, or finished are constantly gaining or losing moisture as humidity and temperature conditions vary during processing. To maintain the desired moisture content of 5% to 8% during drying wood finishes, the relative humidity and temperature in the drying ovens should be controlled as shown in the relative humidity-equilibrium moisture content, Table 1.

Experience has demonstrated that temperatures above 150° F. may rapidly affect moisture content and more frequently cause problems in surface checking joint failure, and glue failure. While controlling relative humidity will reduce or eliminate dimensional changes, assuming the wood is at the desired moisture content prior to finishing, high temperatures alone reduce the joint strength of some adhesives.

Drying oven temperatures above 150° F. are not advisable unless adhesives are used which will not weaken at higher temperatures.

Wood finishes dry by processes of: (1) evaporation, (2) oxidation, and (3) polymerization. All three processes are essential for some finishing materials whereas others require only evaporation. Table 2 shows the manner in which wood finishes dry.

1. Evaporation

All of the conventional wood finishing materials are thinned to working consistency by suitable solvents and vehicles. In drying, the solvent or vehicle must be removed by evaporation. In those finishes in which only evaporation is necessary in drying, the film of solids or the color deposited is dry as soon as all of the solvent has evaporated. The coated part may be dry to handle or recoat long before 100% of the solvent has evaporated. Dye-type stains and lacquer base materials such as shading stains, sealers, topcoats, and toners dry solely by evaporation. There are some toners made with other materials which may require oxidation, polymerization, or both processes in drying. Other types of materials, such as wiping stains, pigmented stains, glazes, fillers, varnishes and synthetics dry by evaporation, in the first stage of curing, followed by one or both of the other processes.

2. Oxidation

Finishing materials, containing vegetable or animal fatty oils as the film forming ingredients, dry by oxidation. In their original state they are liquid or semi-solid in nature. By reaction with oxygen, linkages between particles are formed creating a continuous solid film. Oxygen is obtained from the air and drying agents aid in the process of oxidation. Mild temperatures and good air circulation facilitate this process of drying. Oleoresinous and alkyd type varnishes contain oils, in combination with resinous materials, hence must use the process of oxidation in the latter stages of drying. Fillers, pigmented stains and glazes, which are largely pigmented oils, dry by this process.

Oxygen requirements are satisfied by movement of air through the drying oven. If an insufficient amount of oxygen has been provided, the film will exhibit improper curing by low hardness values. A lack of film hardness and toughness would show up in finishing as poor print resistance, poor sanding, low water and chemical resistance, softening during rubbing and buffing, and poor durability or length of service.

3. Polymerization

Drying or curing films by polymerization refers to the chemical reaction which ties together many molecules forming long chains of the chemical ingredients. In finishes the chemicals would remain in a soft state until resin particles are combined or tied together. As the molecular size and weight increases, the harder, more insoluble, more chemically resistant the finish becomes. The process involves the use of heat or catalysts or both which stimulates greater molecular activity, increases chemical contact, and unites small particles into larger film forming polymers. The force-drying equipment or ovens must provide the temperature required over a sufficient length of time to complete the cure. An increase in temperature from 100° F. to 150° F. shortens the time required for polymerization of heat-converting synthetic finishes. Some formulations require temperatures above 120° F. for optimum hardness and other film properties, so the proper temperature-time schedule must be used for the particular coating. A satisfactory hardness rating is the point at which satisfactory chemical resistance, print resistance and durability are attained although it may not be the optimum for best performance.

TABLE 1. Relative Humidity and Equilibrium Moisture Contents at Several Drying Oven Conditions.

Temp. Dry Bulb of	Equilibrium Moisture Content					
	5 Percent		6 Percent		7 Percent	
	Wet Bulb Depression of	Relative Humidity %	Wet Bulb Depression of	Relative Humidity %	Wet Bulb Depression of	Relative Humidity %
100	28	24	24	32	21	39
110	29.5	27	26	34	22.5	41
120	32	28	27	36	23.5	42
130	34	29	28	38	24	45
140	34	32	29	40	25	47
150	36	33	29	42	25	49

TABLE 2. Drying Processes for Finishing Materials

	Evaporation	Oxidation	Polymerization
Water stains	X		
N G R stains	X		
Pigmented stains	X	X	X
Fillers	X	X	X
Toners	X		
Shading stains	X		
Lacquer sealers & topcoats	X		
Varnish sealers & topcoats	X	X	X
Synthetic sealers & topcoats	X		X

Basic Requirements of Force Drying Equipment

From this discussion we can conclude that the equipment used in drying wood finishing materials applied to furniture and interior woodwork must satisfy four basic requirements:

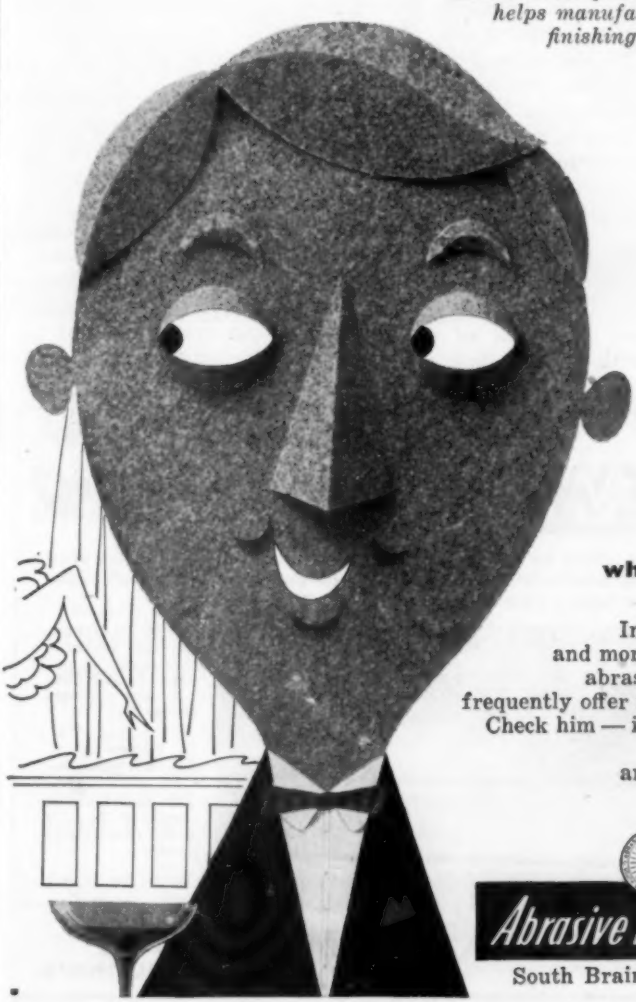
(1) Evaporation of solvent at a desirable rate.
(2) Provide sufficient oxygen and adequate uniform air circulation.
(3) Supply the heat necessary for a sufficient length of time.
(4) Control relative humidity or maintain moisture content of the wood furniture.

Since all furniture finishing materials have vehicles and solvents, the drying starts with evaporating the volatile materials. While the materials supplier must control the rate of evaporation of the solvents to meet average conditions in the plant the drying equipment should be designed to provide a wide range of controllable conditions. If the initial solvent evaporation is too fast, the finish will not flow-out well and bubbles of escaping vapor will form in the finish and may break or be sanded through leaving a crater. A lower temperature or a reduction in circulation or both may be necessary to reduce the rate of evaporation.

During evaporation of solvents, heat is absorbed from the air and the tem-

NO. 2 *"Roughing it"* with
Reddy MacFlint

"Talk about a 'plushy joint'
— you should see the velvet joint
on JEWEL BRAND *Abrasive Belts!*
It's smooth! Won't bump or jump . . .
an AP development that
helps manufacturers speed up
finishing, improve quality.



"Smoothing the way where the going is rough"

In addition to better and more efficient uses for abrasives, AP salesmen frequently offer new developments. Check him — if you're interested in improving an abrasive process.

Abrasive Products, Inc.
South Braintree 85, Mass.

See Action Card, page 160. Circle No. 250

perature of the film surface is lowered. If the temperature is lowered to the dew point, moisture condensation may actually wet the surface. This water condensate frequently causes the solids to "go out of solution" resulting in a whitening of the film which is called blushing or blooming. To avoid this, a proper balance between the type of solvent, temperature and humidity is necessary. A number of steps may be taken to reduce the tendency toward blushing such as decreasing the circulation, lowering the relative humidity by increasing the temperature in the drying area from 5° to 20° F., or by using a retarder in the solution.

The circulation of air in a conveyorized drying oven should preferably be counter to the flow of finished pieces so that the driest, most vapor free air will come in contact with the drier film first, providing the maximum drying efficiency. It is a generally accepted practice to provide a ration of three parts of recirculated air to one of fresh air in drying ovens. Although no definite procedure for determining the exact amount of fresh air is available, the National Board of Fire Underwriters, however, requires not less than 10,000 cubic feet of fresh air per gallon of solvent to be evaporated.

Air circulation to remove vapors and carry heat to the finished surfaces should be uniform throughout the drying oven. If circulation is not evenly distributed through the drying area, temperatures will not be uniform and drying will not produce the results desired in the finished surfaces. Temperature indicators and automatic controls to maintain proper oven conditions are an integral part of force drying systems.

ReNew GIVES NEW LIFE TO SANDPAPER AND CUTS SANDING COST **50%**

Keep your sandpaper cutting for you with ReNew. Apply . . . let it dissolve the pitch or resin . . . then brush it off with a scrubbing brush. It's so easy and quick and makes your sandpaper last at least 3 times as long.

ReNew increases sanding machine efficiency . . . paper lasts longer . . . less changes necessary.

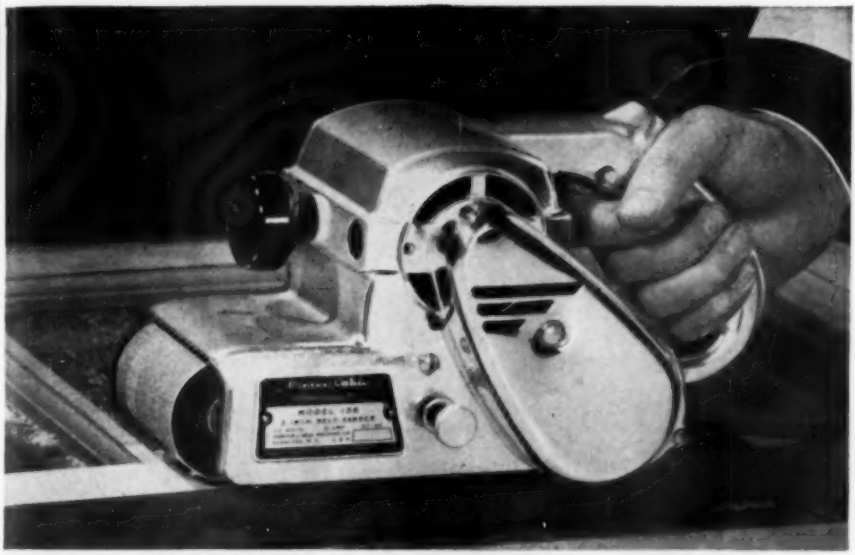
ReNew is non-inflammable.

We also have a complete line of maintenance prints.

Write for prices

MOLINE PAINT MFG. CO.
MOLINE - - - - - - - ILLINOIS

See Action Card, page 160. Circle No. 251



There's a Porter-Cable quality Sander that's right for the job!

Faster, easier, *better* work comes naturally when the tool is properly designed for the job.

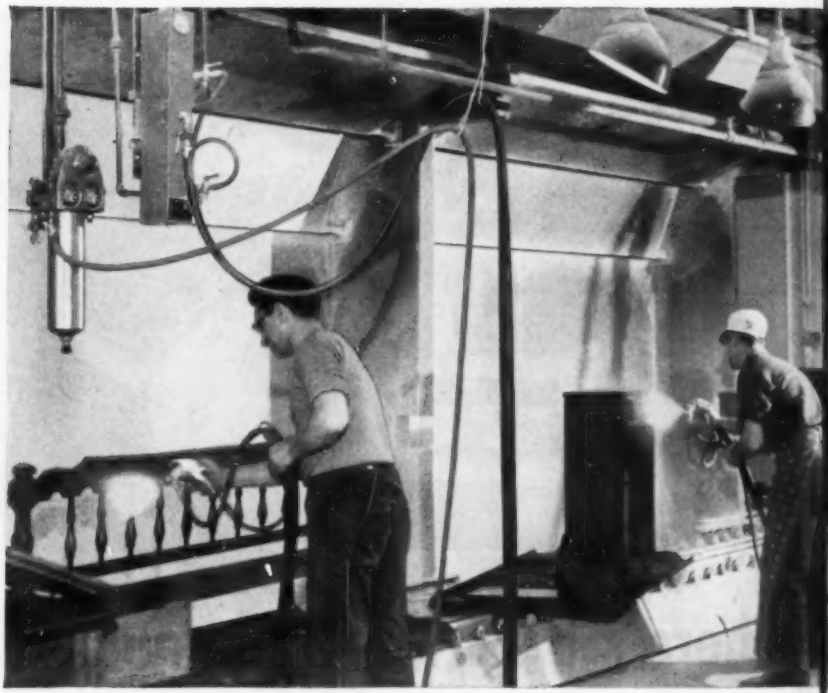
That's why Porter-Cable makes no fewer than *ten* different power Sanders – each one *quality built* to be the finest of its kind. There are five Porter-Cable Belt Sanders, including the superb new 3" Model 136 illustrated, five Finishing Sanders, and a Disc Sander.

Every Porter-Cable Sander delivers performance, long life and *value* far above its cost. Write today for free catalog and the name of your nearest Porter-Cable dealer.

Porter-Cable Machine Company
6190 N. Salina St.
Syracuse 8, N. Y.

Porter-Cable
Quality Electric Tools

See Action Card, page 160. Circle No. 252



An exclusive feature of the DeVilbiss hot-spray system is the remote heater, which circulates hot water for safe, controlled heating of lacquer at the spray booth.

Better finishes with less lacquer, less labor!

Read how Lewisburg Chair improves quality, lowers costs with DeVilbiss hot-spray system

Lewisburg Chair and Furniture Company, Lewisburg, Pa., a DeVilbiss customer for 22 years, is getting smoother finishes, saving material and labor with a new DeVilbiss Paint Heater.

Because thinning paint with heat permits application of higher solid-content material for heavier coats – fewer coats are needed, cutting both production time and labor costs. Lower pressures used with hot spray greatly reduce wasteful overspray, too!

What's more, improved flowout gives smoother, glossier finishes of higher quality – and saves labor by easing the job of hand-rubbing, long featured by Lewisburg Chair.

Similarly, you can improve *your* results with a DeVilbiss Paint Heater. With the consistent temperature and viscosity attained with a DeVilbiss Paint Heater, spray operators find it much easier to get full, wet coats with fewer passes of the gun. Besides, runs, sags and dry spray are much more easily avoided.

For a superior finishing method that will save you up to 50% in materials and labor, ask your DeVilbiss representative about the DeVilbiss hot-spray system!

THE DEVILBISS COMPANY
Toledo 1, Ohio
Santa Clara, Calif. • Barrie, Ontario
London, England
Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY
DEVILBISS

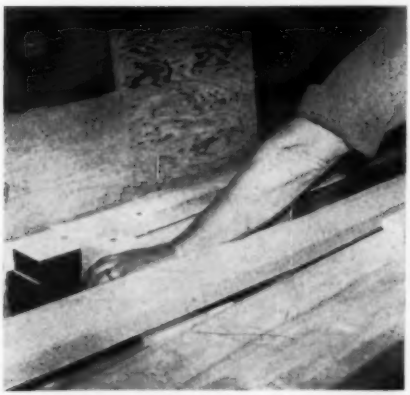
SAFETY AT A GLANCE

By

E. Mottershead

SANDING MACHINES

WRONG—Large disc sanders such as this should never be operated by unauthorized or untrained personnel. While this machine is provided with a hood, attached to a suction unit to remove the dust, the hood could well be lower and serve at the same time as a guard over a greater area of the sanding disc. Note that all portions of the disc below the table are enclosed, as is the belt drive. Only gentle pressure is required to remove material from piece being sanded.



WRONG—This is a fine way to get a very bad cut, with particles of wood ground into it, leading to infection. Never reach across or between the parts of the sanding belt to pick up more material. Pile raw stock somewhere else and reach for it safely. Cuts like this, as other sanding injuries, are due to improper operation.

WRONG—Arrow shows direction of belt travel. Workman cornering a board this way, into the grain, is not only in danger of splintering off the corner and ruining the piece; there is some danger of tearing the belt, creating a weakness so that it might break and fly around, hitting the workman, and causing severe lacerations

RIGHT—Correct cornering of a piece is shown across the grain with gentle pressure. No danger here of splintering or tearing the sanding belt. The right hand holds the piece firmly on the table, and the left hand advances it gently into the belt as the cut is made. It's safe and easy when it's done correctly.

WRONG—While a small piece always presents a problem in holding it, it definitely should be held down against the work table instead of above the table as shown. It is virtually impossible to sand a square surface in this position, and there is constant danger of slipping or jerking from uneven pressure being applied. Use a jig.

WRONG—This is a good way to get the ends of the fingers burned off to the joint. Fingers and hands must be kept well away from the abrasive surface of the sanding belt, and the block being sanded must be held down securely on the work table. Though not as hazardous as a power saw or jointer, the surface speed of the belt is high, and this machine must be operated by a workman who knows what he is doing and uses safe methods.

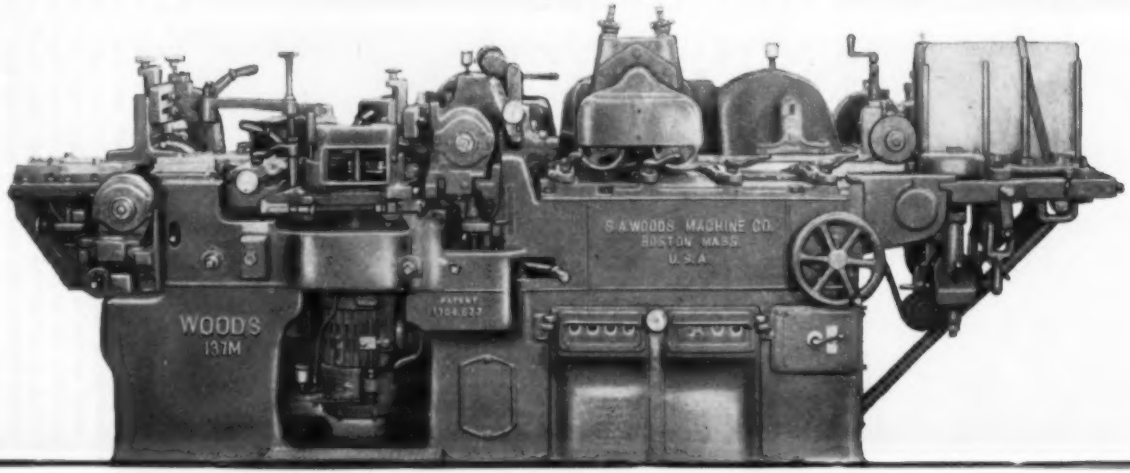
RIGHT—Position of hands as above is safe, free from finger burns or abrasions. Also, workman is standing slightly to one side, out of the line of fire, should the piece suddenly kick up at him for any reason. In this case, all belt drives are covered, and an exhaust is provided to carry away dust and chips. A positive and locking belt shifter is within easy reach of the operator so he can use the full surface of the belt safely.

Serving the Industry Since 1852

It's Masterful!

This 6" LAG BED ELECTRIC MOULDER

built by "The Moulder of Woods" ®



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shown with hopper feeding attachment
Feed rates to 160 f.p.m.

Modernize to Economize!

shown with hopper feeding attachment
Feed rates to 160 f.p.m.

A moulder adapted to every woodworking plant that does moulding work of any kind; furniture, cabinets, chairs, trim and interior finish.

The new Woods 137M Moulder Series bring to the Industry, a new concept in spindle design, the Woods *tapered spindle*. Your production costs go down, your production rate increases, with Woods *tapered spindles*.

Cutterhead sleeves and bushings are eliminated, securing more rigid cutterhead fit on spindle. Removal and mounting of cutterheads becomes a matter of moments—a simple and easy operation. Let us tell you more about Woods *tapered spindles* and the many other exclusive time and money saving features built into the new Woods 137 Moulder Series.

Send today for your copy of the new 137 catalogue.

S. A. WOODS MACHINE CO.

27 DAMRELL STREET

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Branch Offices: ARK., Little Rock CALIF., San Mateo N.C., Greensboro N.Y., Mount Vernon ORE., Portland TENN., Memphis

Canadian: B.C., Vancouver, Akhurst Mchy. Co. ONT., Galt, Canada Mchy. Co.

Export Dept. United States Machinery Co., 90 Broad St., New York City

See Action Card, page 160. Circle No. 258

Finishing Clinic

This feature will be appearing for the next several months. Send us your problems and we shall try to provide answers.

We have been told that a commercial disc sander is available for automatic sanding of drawers. Can you describe this sander?

Any commercial disc drawer sander of the type you describe is not known to be manufactured at this time. A machine said to have been developed by and built for a furniture plant for its own use was reported some time ago which did use sanding discs for drawer sanding. This sander was made up of two small machine frames mounted on a lathe-type bed carrying separate horizontal shafts in bearings. A sanding disc was mounted on the inner end of each shaft driven by pulleys mounted between each pair of bearings to provide opposed sanding discs. One was stationary and the other was adjustably mounted. With the drawer being moved by a carriage between the sanding discs, the adjustable disc was moved toward the stationary disc by foot pedal control until the drawer between the discs was sanded to predetermined size governed by setting the amount of disc travel.

• • •

Our finishing foreman complains that my sanding in the white is not fine enough to permit him to produce a good finished surface, due to coarse scratches. We use a rather heavy combination stain-filler over the white wood and I contend that even where sanding is not too fine, this filler will even up the sanding scratches. Am I right in this?

No. Your finishing foreman apparently knows what he is talking about. A smooth sanding job in the white is required for the finisher to turn out a uniformly-colored, smooth-finished surface. Coarse sanding usually produces uneven stain effects that are caused by uneven stain penetration. The filler does not usually even up the surface be-

For luxury finishes like this... 3M "Wetordry" paper outperforms ordinary abrasives 2 to 1!

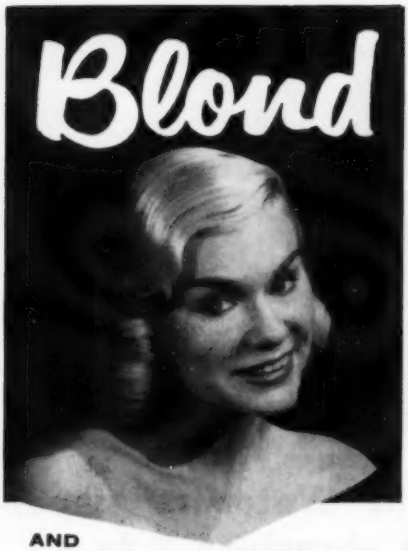
Conover Cable Piano Co., makers of the world-famous Cable piano, tested all types of abrasive papers on the market for finish sanding of their piano cases. Results were conclusive: 3M "Wetordry" Tri-M-ite sheets, Grits #360 and #400, give a far more consistent finish than any other abrasive paper, *and* last up to twice as long.

Too, this Oregon, Illinois manufacturer finds that "Wetordry" paper is smoother cutting, more consistent, and gives a higher luster finish on the top lacquer coat. 3M "Wetordry" paper is the *original* waterproof sandpaper, used by craftsmen the world over for fine wood finishing. For full details about 3M "Wetordry" and the complete line of 3M Coated Abrasives, write Minnesota Mining and Manufacturing Company, Dept.HD-106. St. Paul 6, Minn., for a FREE copy of the booklet "3M System for Sanding and Finishing Wood".

3M ABRASIVES

Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: P.O. Box 757, London, Ontario. Export Sales Office: 99 Park Avenue, New York City. Makers of "Scotch" Brand Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing.

See Action Card, page 160. Circle No. 255



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Beautiful

PRODUCTION FINISHES

BY Dayco

Dayco blond stains and finishes give uniform colors and tones with maximum penetration. Require no wiping or costly curing time. Dry quickly (1 hour), enable you to finish faster. Available in a wide range of smart colors. Let Dayco blond wood stains help *you* produce a more beautiful, easier to sell line.

Write for chips, testing samples and prices.

JAMES B. DAY & COMPANY

1872 Clybourn Avenue

Chicago 14, Ill.

1906 1956

FIFTIETH ANNIVERSARY

See Action Card, page 160. Circle No. 256

cause scratches put in by sanding are seldom of the same depth as the wood pores and the filler has a tendency to pull out.

• • •

We have just started to use water as a lubricant for wet sanding of our lacquer finish. The paper begins to stick after only a few strokes with the sander even though the finish is apparently hard and thoroughly dried. What causes this and how can it be remedied?

Finishers to whom your problem was referred do not approve of the use of plain water for wet-sanding lacquer. They diagnose the cause of sticking as being due to the lacquer loading up the sandpaper. They recommend the use of a good softening or wetting agent in the water which will permit the entire surface of the sandpaper to be wetted to prevent loading and sticking. Many seem to prefer the use of soap solutions, as dissolved soap flakes or green soap. One recommends the use of a solution made up of about one tablespoonful of tri-sodium phosphate to one gallon of water.

• • •

How can we obtain a Tudor English finish on oak for a small order of library furniture?

It is assumed that you are referring to the color and antique effects rather than the complete finishing schedule. A red oil stain is commonly used, such as 1 lb. venetian red to 4 gallons benzine, along with a reddish brown paste filler, usually cut about 1 quart naphtha

DEMON FOR HIGH PRODUCTION!

- HIGH SPEED
- SEMI-AUTO-MATIC
- DUST-PROOF
- REVERSIBLE
- CAPACITY TO 10'8"
- FRICTION-FREE STROKER

MODEL D SINGLE-BELT SANDER

Year-in and year-out shop use continues to prove the high efficiency of O'kley quality sanding machines. Operators and owners alike depend on Oakley for the sanders and the "know-how" to get the job done . . . profitably!

WRITE FOR DETAILS TODAY!

The Oakley Co.
SINCE 1934

BRISTOL TENNESSEE

See Action Card, page 160. Circle No. 257

to 2 lbs. filler. Antiquing is done by spraying a shading stain, darker around the edges and lighter toward the center. Worn effects are sometimes simulated by steel wooling.

• • •

Against my better judgment we recently changed over to a somewhat cheaper sealer. It seems to produce a brittle film but I can't explain why. Can you?

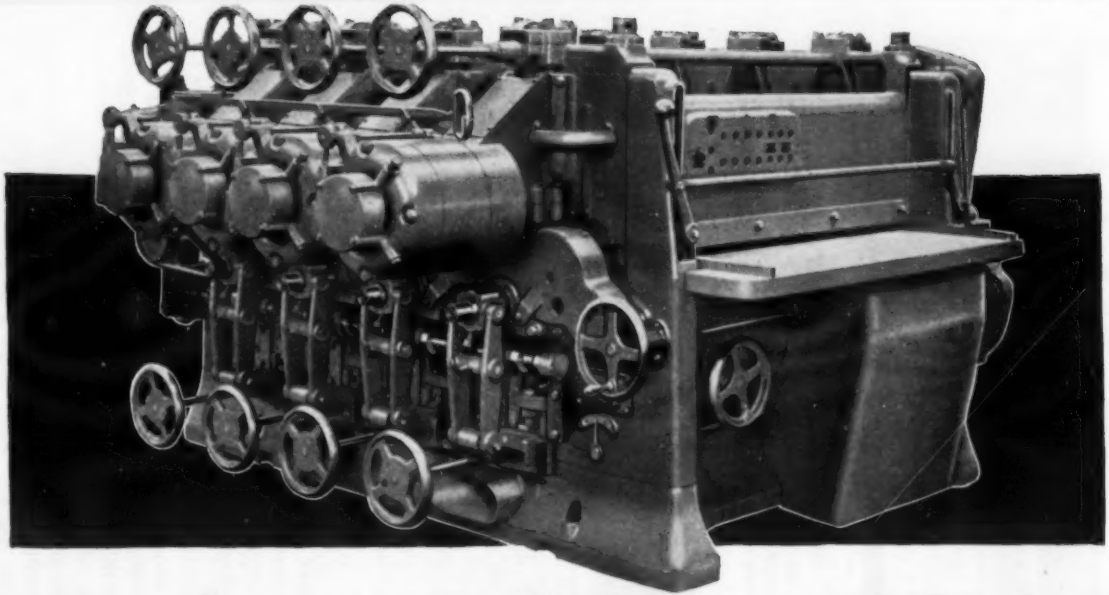
Without knowing more about this specific sealer, it is quite difficult to pinpoint the cause for the brittle film. Based upon the experience of other finishers, however, it may be that the cheaper sealer is formulated with rapid evaporating solvents which do not allow the sealer sufficient time to get a firm hold in the wood by required penetration of the filler and wood fibers.

• • •

We manufacture custom reproduction furniture pieces for the carriage trade. A customer has ordered a mahogany secretary finished with a hand-rubbed shellac finish. This is a new finish to us and we would appreciate receiving a typical finishing schedule.

A reputable finishing engineer advises the following to produce a good hand-rubbed shellac finish on mahogany with a rich depth of tone:

First, apply a chrome stain to bring out color and tone; then, apply an oil filler, work it in well and allow to dry thoroughly after wiping.



Improved way to finish particle board

eliminates chip-tearout problems

Mills using Yates-American Double-Deck Sanders come up with performance figures that are eye-openers!

You must agree that we at Yates-American can be unbiased in discussing the merits of surfacers versus sanders in chip-core operations. After

get only from a *sander* — the Yates-American Double-Deck, in particular. Leading mills throughout the country back us up on that!

Does the Entire Job!

With the Yates Sander, finishing particle board is done in *one* operation!

It removes up to 3/16″ of stock (depending upon density of board)

already purchased Yates-American Double-Deck Sanders:

American Parboard Corp.
Black Mountain, N. C.

Carolina Forest Products, Inc.

Columbia Hardbord Co.
Everett, Washington

Granite Board, Inc.
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Rock Island Millwork Co.
Rock Island, Illinois

Door Co.
Minneapolis, Minnesota

Weyerhaeuser

are eye-openers!

You must agree that we at Yates-American can be unbiased in discussing the merits of surfacers versus sanders in chip-core operations. After all, we make both types of machines.

We feel that Yates-American surfacers are the finest. But — it is our honest opinion that *any* surfacer has *limitations,* when it comes to finishing particle board.

We estimate that about 60% of the end-use requirements for particle board call for a smooth finish you can

Does the Entire Job!

With the Yates finisher, finishing particle board is done in *one* operation!

It removes up to 3/16" of stock (depending upon density of board) —at rates up to 50 feet per minute. It holds tolerances of less than ±.002" over an entire sheet — *that we guarantee!*

There are no expensive carbide knives to joint, regrind, and reset. *No knife marks or chip tearout.*

Preferred by Leaders!

Leading companies like these have

Carolina Forest Products, Inc.
Black Mountain, N. C.

Columbia Hardboard Co.
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Clinton, Iowa

Elmon Gray Co.
Waverley, Virginia

Rock Island Millwork Co.
Rock Island, Illinois

Door Co.
Minneapolis, Minnesota

Weyerhaeuser Timber Co.
North Bend, Oregon

Wynnewood Products Co.
Jacksonville, Texas

Don't you think a Yates Double-Deck Sander should figure in *your* particle board plans? Ask your nearby Yates-American man to make recommendations. Or write, wire, or phone us today at Beloit.

See Action Card, page 160. Circle No. 254

Yates-American
BELOIT, WISCONSIN

Branch Offices: Chicago, Illinois
High Point, North Carolina
Memphis, Tennessee
Portland, Oregon

WMMA Woodworking Machinery Manufacturers' Association

First with the *Finest* in woodworking machinery. Established in 1883

MATCHERS • MOULDERS • SURFACERS • RIPSAWS • RESAWS • SANDERS

WW-9

How's this for SANDPAPER LIFE!

Here are some figures that are hard to believe — we blinked once or twice ourselves, when we first saw them. But they're fact — actual performance figures supplied to us by two reputable companies, names you'd recognize at once.

Both mills are finishing particle board with a Yates-American Double-Deck Sander and are removing up to 3/16" of stock. This is what they report on sandpaper life:

First two pairs of drums.....	1200 to 1500 hours
Third pair of drums.....	500 to 700 hours
Fourth pair of drums.....	150 to 200 hours

We repeat — these are not *our* figures. They've been furnished to us by *two different mills* and have been confirmed and re-confirmed.

For cleaning metal, wood and plastic surfaces before painting. Order today through your supplier.

DETRO SALES CO., INC., *Culver City, Calif.*
Standard of the Finishing Industry Since 1934
See Action Card, page 160. Circle No. 259

Proved Best for Furniture!

Randolph

LACQUER WD 8461

Here's a fine all-around standard lacquer that meets every requirement for an unexcelled finish for furniture and wood products.

This lacquer resists cold check, printing, chipping, marring; affords perfect rubbing qualities, excellent film body on finished article, and it helps you cut costs!

Use it for best results. Write us for complete information on Randolph WD 8461 today!

Randolph Products Co.
Dept. W Carlstadt, N.J.

See Action Card, page 160. Circle No. 260

Spray a sealer coat of cut shellac, dry thoroughly and sand smooth.

Apply three separate top coats of 4 lb. cut orange shellac, drying each coat thoroughly between applications.

When the final top coat is thoroughly dry, rub down the finished surface with fine pumice and a lubricant of turpentine and linseed oil.

This finishing process is necessarily slow and not a production finishing schedule but it is reported to provide a good finish that is attractive and long wearing.

• • •

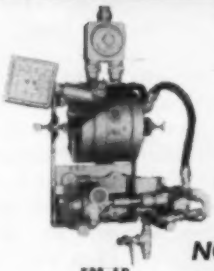
Can you tell us the difference between old and modern methods of manufacturing shellac to settle an argument between the purchasing agent and myself?

In the older method of shellac manufacture the seedlac was first melted and the mass was then squeezed through filtercloth. The seedlac is the resinous matter, after separation from the wood, which was originally deposited on the tree twigs by the insect "laccifer lacca," from which the name derives. In the modern method of shellac manufacture a solvent process is used in which the seedlac is first dissolved in an alcohol-type solvent and the solution is then filtered removing the solvent to produce the shellac product ready for dewaxing.

• • •

Our finishing material supplier does not furnish our compounding material for the water-wash spray booth

SPEE-FLO Announces the
ROTOFLO "Clipper"
Clips TIME, MATERIALS, REJECTS
from your finishing costs



600 AR
"CLIPPER"

No pressure system needed with the new ROTOFLO. Its rotary suction pump takes material directly from the original container . . . pumps, heats and circulates. Change material in less than a minute. Ideal for clear lacquers and varnishes. Available in two models, rated at 7.5 and 15 gallons per hour.

NOW! — USE SPEE-FLO'S "CLIPPER" FOR FULL HOT SPRAY BENEFITS

Get constant viscosity with controlled temperature. Uniform, faster application gives you more build per coat, and reduces shrinkage. Eliminates blushing . stops runs and sags! Reduced overspray saves material. Ask for a ROTOFLO "Clipper" demonstration.

WRITE TODAY FOR FREE BOOK "WHY HOT SPRAY?"

THE SPEE-FLO COMPANY
720 POLK • HOUSTON, TEXAS

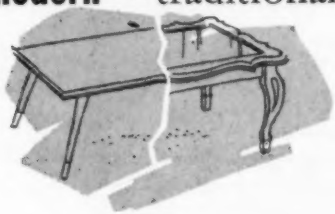
6574

See Action Card, page 160. Circle No. 261

but suggests that there is a simple method of determining proper compound with the hands by "feel." Can you tell us how this method works?

This method of testing involves first wetting the hand with compounded water at the booth and then skimming off some of the floating waste with the wet hand. As much as possible of the water is squeezed out until the material in the hand feels like putty. Where the material is very dry and of pigment consistency, the compound water is determined to be too strong requiring the addition of untreated water. Where the material tends to stick to the hand, this indicates the solution is too weak and more compound should be added. If the compound tests properly to require no adjustment, the material is not sticky

modern -- traditional



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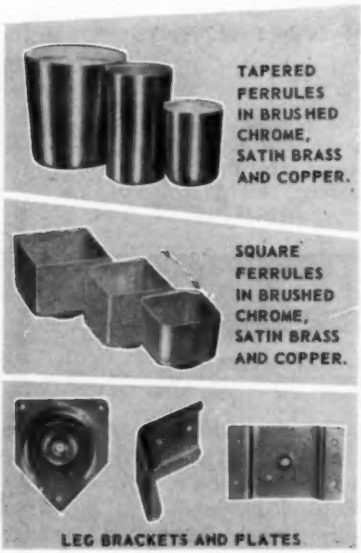
makes the finest in furniture hardware

Yes, and we're continually designing and developing new styles and finishes to meet the ever growing demand for fine furniture hardware.


TAPERED FERRULES IN BRUSHED CHROME, SATIN BRASS AND COPPER.
SQUARE FERRULES IN BRUSHED CHROME, SATIN BRASS AND COPPER.
LEG BRACKETS AND PLATES

A dependable service since 1919
WINZELER STAMPING CO.
Montpelier, Ohio

See Action Card, page 160. Circle No. 262

but does form a mass of putty-like consistency.

• • •

Some of our products which I have to finish consist of parts made of both dense and open-grain woods in a single construction. This presents a difficult problem in obtaining a uniform color over the entire surface. How do other finishers handle this problem?

This problem is handled in two ways in various plants contacted. A dye stain may be applied first over the dense wood portions to compensate for color loss before the body stain is applied, or only the open-grain wood portions may be filled to prevent any of the stain being removed from the dense-wood portions by the filler. A final uniform toner coat is often applied over the sealer to uniform any slight color differences remaining.

• • •

Is there any water in the NGR stains?

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simplest. Puddle water or alcohol on the film surface and place something, like a glass, over it and let it remain there until the liquid has evaporated. For the alcohol test, the alcohol should approximate the strength of beverage alcohol. It is also a good idea to age the finish film for 2 to 4 weeks before testing, as changes take place in the film in drying which characteristics should be fully developed at the end of the recommended aging time.

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Minneapolis was an aggressive city, twenty-five years young; in 1881 the year the Day Company was founded. At that time, the Day Company was known as the H. L. Day Sheet Metal Company. It was one of many firms whose growth closely parallels that of the flour mills and lumber mills then located in Minneapolis.

In early flour mills and grain elevators dust control was a serious problem not reckoned with by many firms. Poor plant dust control (or in most cases, no dust control at all) resulted in serious explosions and fires. These disasters would wipe out the entire building or structure.

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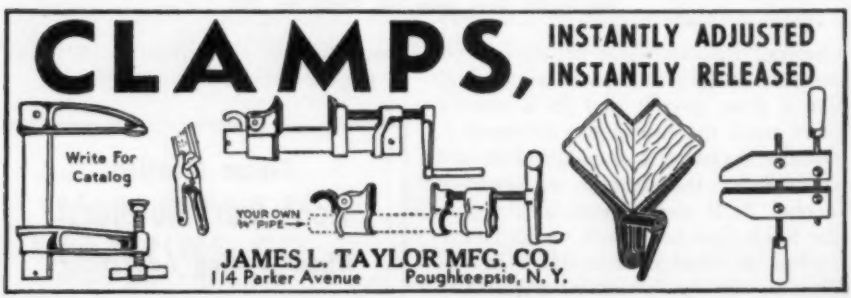

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VENEER, PLYWOOD and LAMINATED WOOD

FEATURES

Importance of Plywood In Door Construction

Avoiding Overcut On Veneer Orders

Production of Hi-Fi Cases with Plywood

Production of Hi-Fi Cases with Plywood

Can marine plywood be used in the production of hi-fi equipment? This and other questions are answered in an on-the-job story in the shop of a hi-fi manufacturer.

Small firms like this are potential big companies. Stories of their development and growth encourage others to begin wood products manufacture of one type or another.

IT MAY seem to be a far cry from the hi-fi world of "woofers" and "tweeters" to the realm of woodworking. Yet there is a close family relationship between the swing of a needle on an electronics instrument and the type of wood used as a case for the equipment.

Step into a typical successful hi-fi shop to see this relationship. "Science In Sound," 777 Santa Cruz Ave., Menlo Park, Calif., operates a first-class woodworking shop as an indispensable part of its sound equipment business. Supervised by Foreman Sidney C. Barlet, the shop produces a substantial volume of speaker enclosures, furniture with built-in speakers and sound equipment cabinets.

An estimated 40 % of production is custom-built to designs created by owner Dell Hansen and his wife Dagmar—an electronics engineer in her own right. Mr. Hansen designs the modern pieces and Mrs. Hansen creates period pieces, often after consultations with customers and a visit to their homes to see how the finished product will fit in.

It is no "small-change" operation. Mr. Hansen, who went into his present location only a year ago, reports that monthly gross averages $50,000 and more. A fleet of six trucks makes deliveries, after products are completed by the 6-man crew.

Between 400 and 600 square feet of exterior grade fir plywood, 4′ x 8′ panels, are consumed each week. The panels range in thickness from ¼″ to some laminated to 2½″ thick.

Patrick Farrell is in charge of producing "Weirdies." The one shown here is a prime example.

The tools that do the work include table, jig, bench and sabre saws; belt and disc sanders; jointer and planer as well as various portable power tools for on-the-job construction and finishing. Most work goes out unpainted.

Adjacent to the shop is the "Symphony Room" with samples of many of the shop's products. This hi-fi salon is furnished like a modern living room, with subdued lighting, rush square carpet and comfortable chairs and sofas. Devoid of right angles, it is acoustically treated, with acoustic wallpaper over plaster. Throughout the 20′ x 24′ room are 56 concealed speakers—one hidden behind a mirror, one in an ottoman, another in the base of a Hansen-designed cocktail table. Smallest is a 3½″ speaker designed by Mrs. Hansen.

Concealed speakers are a specialty of Science In Sound. Most lavish installation was a $4,000 job in a doctor's living room. It included hidden microphones and 18 unseen speakers in the one room. Each concealed unit represented a problem in cabinetwork.

Another Hansen product, which operates the 56 speakers in the Symphony Room, is an 8′ console which the owner says is "bought out from under" him on an average of once a month for $4,800. The unit, 32″ deep by 54″ high, is finished in mahogany and entirely produced in the shop. It operates the bewildering variety of speakers on

Among Science In Sound's most elaborate production items is this console valued at $4,800. It operates 56 speakers.

Uniformed workman in company's shop edge coats shelves with adhesive before assembling a sound equipment rack.

28 two-way switches on a control panel. The console incorporates two turntables, a Stereo-Monoral tape recorder, nine arms and cartridges, four amplifiers and pre-amplifiers, two scratch filters and a binaural tuner.

With the exception of the console, any article in the Symphony Room can be shop-built in four hours, Hansen claims. No matter how complex from an electronics or woodworking standpoint, any unit can be delivered the day after it is ordered. One reason is that the shop makes good use of templates for the many speaker enclosures which are more or less stock items. Templates used are metal or loose Fiberglas.

Patrick Farrell, has charge of the "Weirdie" department. "Weirdie" is the term applied to any oddly-shaped

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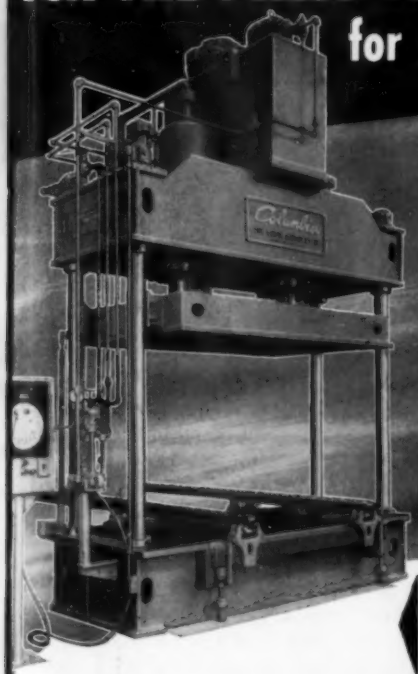

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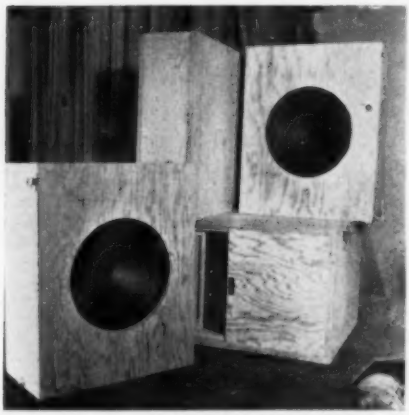
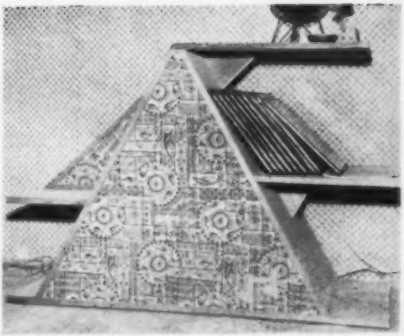
speaker enclosure—and this covers a good many of them. With modern taste running to free forms in furnishings, the shape of an enclosure is limited only by the imagination of the customer and the designer.

A great many enclosures are built on the job, right in the customer's home. Here again, the variety of jobs is practically endless. For one client, Science In Sound has just made an electronics closet, at a cost of $2,500. This required taking exact measurements of the available floor area, then building a 2" x 4" framework to fit it precisely. The frame was bolted down, then the interior and the floor were lined with Celotex. A sturdy frame was required because shelves loaded with electronic equipment pull out like drawers and exert considerable torque on the structural members.



Multi-purpose unit designed for sales demonstrations and as a P. A. system joins together like a Chinese puzzle.



This is one of Mr. Hansen's modern designs—a pyramid using 1/2" fir plywood and 1/4" mahogany. Fabric is a Tahitian print.

Another recent job called for building an entire false wall out from the existing wall, so that the new wall could serve as a sounding board for speakers. It was built 12' wide and 8' high. For this kind of job Hansen pockets about $3,000.

Nearly all enclosures and furniture are built of plywood, and Hansen uses only exterior grade, because he says its sound qualities are best. He would use marine

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2023 EASTERN AVENUE

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grade, even though it is more costly, except for the fact that it is too loaded with glue to resonate properly. Speaker enclosures, whether built obviously as such or concealed as furniture, must be well and strongly built. Hansen points out that an 8" speaker exerts a pressure of 1,500 lbs. per square inch. Vibration is as high as 19,000 times (cycles) a second.

Standard operating procedure is to construct models of every new project, using ordinary cardboard. Then a pencil-type speaker is inserted to test the finished model. Resonance of cardboard is similar to that of plywood. In building the full-scale jobs, practice is to miter, glue and finish-nail joints.

Some jobs are amazingly complicated. One, to be used by a salesman for demonstrations and as a public address system, was about the size and shape of a medium-sized trunk when completed. But a system of latches permitted the various components to be split apart into several units, like a Chinese puzzle.

In making furniture to enclose speakers, the shop turns out the job in fir plywood to which is bonded a veneer of mahogany. Reason for not using mahogany plywood throughout is not to save money, but because of fir plywood's better sound quality. "Fir plywood, exterior grade, doesn't rattle when it's used as a speaker enclosure," Hansen claims.

Method used for laminating mahogany veneer to the basic material is by clamping. Sometimes fir plywood is built up into 2½-inch thickness, as for a one-ton speaker unit that sells for $1,285. On the other hand, very light plywood is used to conform to the curve of a chair arm into which a speaker is built.

Speaker enclosures are also disguised as planters, room dividers, light fixtures, bookshelves and even as an old-fashioned grandfather's clock. Production is under way on cabinets of plywood for tape recorders.

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We cannot but feel that we are entitled to a little reflected glory from these various "success stories" because it was with Coe machinery that the profits were made which enabled these fine examples of *free enterprise at work* and *corporate growth* to occur.

With the inspiration of this lesson clearly in mind, we will continue to direct our energies toward making machines that if they are not always the *cheapest* are as nearly as possible the *best.*

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IMPORTANCE OF PLYWOOD IN DOOR CONSTRUCTION

By Thomas D. Perry

DOORS, of one kind or another, have served for untold centuries to protect the home from intruders as well as from the weather. The use of such a protective barrier began as soon as the family units started to establish permanent homes. Even in the primitive cave homes a stone was rolled against the opening or an animal skin was hung at the mouth of the cave. As the use of wood developed and boards were split or sawn from logs, we find the rudiments of the use of wood for a house. The value of wood to the human race is graphically demonstrated by the fact that wood has been the principal material for human dwellings ever since the dawn of recorded history, and still is. More individual homes are now built of wood than of any other material.

The first wooden door was made of rough hewn or sawn slabs. This slab door has survived, and occasionally is seen today, as an emblem of what used to be. Even with the best modern machinery and techniques the slab door has a major shortcoming. In its width of some 30" it may shrink or swell as much as an inch, which at an edge or divided into several cracks, fails to fulfill its purpose of privacy. It was from a slab door that the "latch string hangs out" or is pulled in!

There is no record as to when the panel door was first developed. Obviously, with its vertical stiles and horizontal rails, it reduced the shrinkable width of a door from 30" to 6" or 8", comprising only the stiles. Panel doors with solid panels date back to earliest colonial times, and many of them, which have been preserved, are still sturdy and useful.

Panel doors for large and pretentious homes, and also for public buildings had much decorative molding to protect against the inevitable shrinkage cracks at the edges of the panels. The panels were often "raised," or more properly described as thick at the center and tapered to thin edges and ends to fit into ¼" grooves in the stiles and rails. Such doors are sometimes custom made today for large houses and public edifices. While such doors may have some attractiveness, they are most efficient dust catchers, and the inevitable joints are likely to open, with consequent sagging.

The records seem to indicate that the Portland (Oregon) Manufacturing

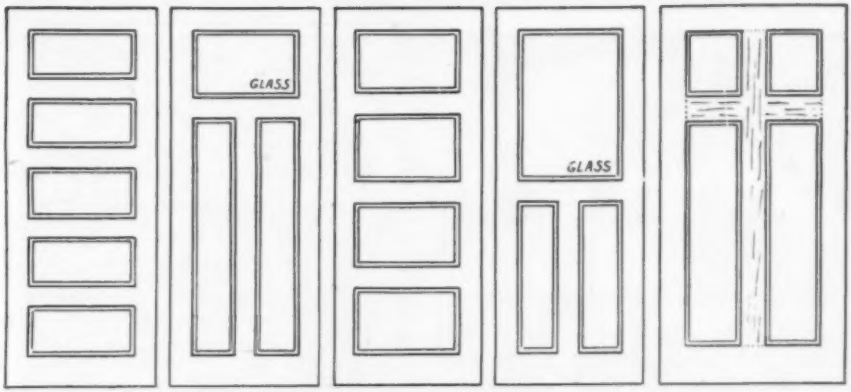

Figure 1. Typical doors with plywood panels.

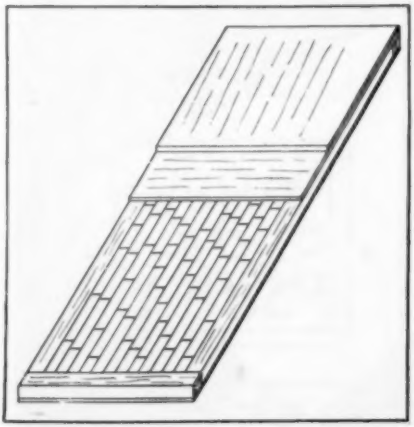

Figure 2. Cut-away view of early flush doors.

Company made plywood door panels about 1905, using rather crude equipment and glues that were not in any sense waterproof, but a real start had been made in the direction of plywood doors. It was at the Lewis & Clark Exposition in Portland, Oregon, that Douglas fir plywood was first publicly demonstrated, but its use as a structural material was seriously retarded by the poor quality of the glues and the lack of efficient plywood machinery. These early plywood door panels were also fitted in grooves and added an important feature in door design. The plywood panels would not shrink nor swell; consequently split, shrunken or swollen door panels were on the way "out."

There is a tradition, undoubtedly based on facts, which may however have grown with the years, as most good stories are inclined to do. The lumber jacks around McCleary, Washington, sometimes came to town to spend their accumulated pay on a short but glorious spree. They were burly fellows boasting of their strength, and their exuberance, after a few drinks, knew no bounds. After every departure, the hotel owner faced a costly job of repairs, as they had damaged almost every thing breakable. One of their favorite amusements was to knock out door panels, which were thin solid wood at that time, with one blow of their massive fists. They were a tempting target at just the right height. The hotel owner had a clever idea, and substituted sturdy plywood panels in all the broken doors, and said nothing about the change. On the next visitation the lumber jacks turned to their favorite

amusement, that of smashing door panels. The toughness of the plywood and the many sturdy sharp splinters in their hands soon convinced the woodsmen that the sport of smashing doors had lost its charm, and this sort of depredation came to an abrupt end, with the hotel owner the undisputed victor in the contest.

Transition Years in Plywood Doors

During the next 10 or 20 years, plywood door panels grew in popularity, and every door factory was obliged to install plywood equipment to make the panels it needed. Toward the end of this period a gradual but marked transition had come about. The demand grew for more and more plywood in large stock sizes, and plywood producers were forced to find outlets for defective or undersized plywood sheets. Such by-product plywood could profitably be cut down to door panel sizes with little waste. Hence by the end of this period every plywood mill was obliged to find a dependable outlet for these cut-downs, usually by installing a door department or buying a door factory. As the number of plywood producers increased, the number of independent door factories diminished. A few designs of doors with plywood panels are shown in Fig. 1.

The sketch on the right shows (shaded) the emblem of a cross. Such designs were common in colonial times, and were reputed to drive away witches. Such traditional designs are sometimes made, even today, showing how slowly established customs yield to modern changes.

The use of plywood door panels is still an important factor in western areas, and bids fair to be so for many years to come. However, such panel

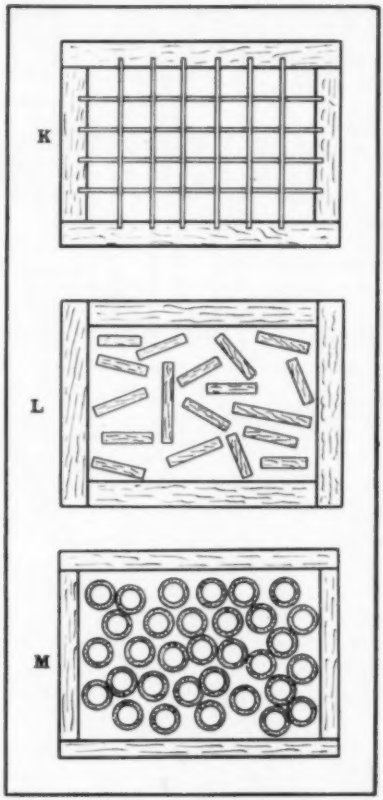

Figure 3. Types of semi-hollow cores for flush doors.

doors are meeting growing competition from a relatively new development in the house building industry, i.e., the flush plywood door. This originated in the hardwood plywood field, and was designed especially for public buildings.

Flush Plywood Doors

It is believed that plywood flush doors were first made on a commercial scale, in the Chicago area before 1910, but for the next ten years sales were very limited. About 1920, Roddis with

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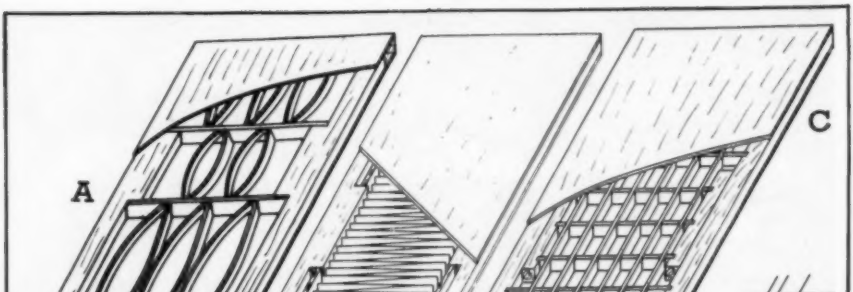

Figure 4. Types of flush doors with semi-hollow cores.

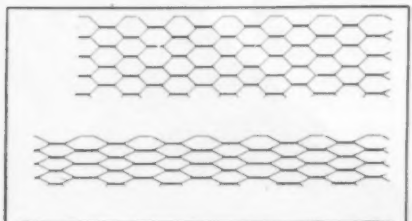

Figure 5. Making paper honeycomb core material.

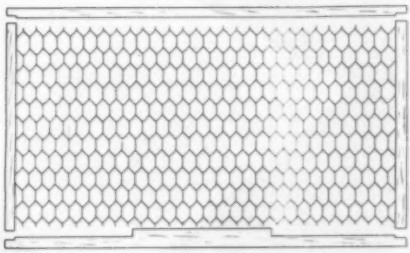

Figure 6. Expanded honeycomb core in a flush door.

a Wisconsin plywood factory, undertook to popularize flush doors, and with substantial success. The Statler Hotels were one of the firm's first large customers, and continued to use flush doors exclusively for many years thereafter. Such doors were particularly adapted to schools, hotels, hospitals and the like, where the smooth surfaces facilitated easy cleaning. In addition, the sturdy softwood core proved to be much more sound proof than the panel door. Most of them approached 2″ in thickness, were heavy and in the upper cost brackets. In spite of these facts, in the next decade, that of the 1930's flush doors became recognized as a standard design for many types of public buildings. They were sturdy, and with faces and cross bands of dense birch veneer, they withstood exceedingly hard service, without damage, and with no impairment in their attractive appearance.

There was an important economic factor that favored their manufacture in the mid-west. There were many sash and door factories in the Mississippi River Valley, using white pine

as long as it lasted, and then bringing in western and sugar pine from the far west. The waste cuttings from these sash and doors were mostly under 12" long, narrow, and 6/4" thick, for which there was no practical use except as fuel. It was soon discovered that these short cuttings, properly machined, would make ideal cores for flush doors. With so many end and edge joints, these cores were practically warp-proof, an essential quality in flush doors. Ingenious methods and machines were developed to convert these small blocks into glued up cores. Stiles and rails were glued to these cores, as is indicated in Fig. 2. The cost of these core blocks was little more than their transportation, and automatic machinery kept the cost of this block core at a most reasonable figure, compared with solid lumber cores.

Another economic factor favoring these flush doors was the fact that choice veneer faces, some 82" long, could be cut from the clear outer section of the log. As soon as defects began to develop, the remaining bolt was cut in half, lengthwise, and while still hot, was mounted in a smaller lathe to cut the cross bands. This gave excellent log yield in the door department, with a minimum of lay-backs.

The popularity of the flush door grew by leaps and bounds, but the weight and cost of the flush door with solid core retarded its further adoption, except in streamlined homes of modern design, which were in the higher cost ranges.

Struggling for Lower Costs

It was obvious that attempts would be made to build hollow flush doors, consisting of stiles and rails with plywood faces, but without a central core.

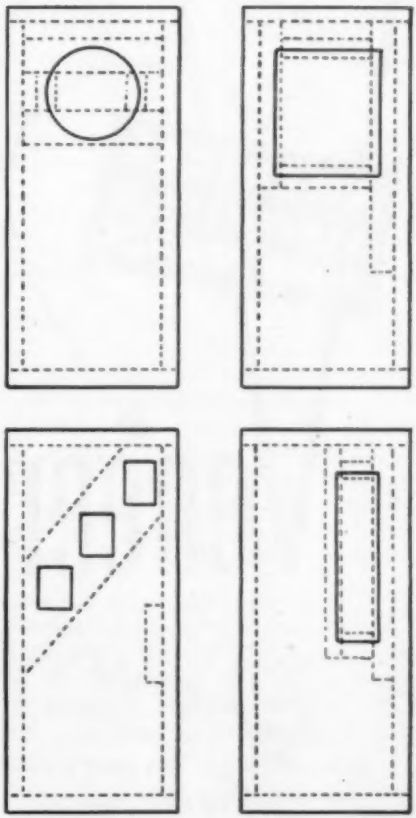

Figure 7. Cut-outs in flush doors of plywood.

Such were not successful, since the surfaces tended to be concave, and the sound proofness of the solid pine core was replaced with a drum effect, that made echoes. Some hollow doors of this type with two or three cross members, are still made, but most regard them as distinctly inferior in quality and serviceability.

Much ingenuity was devoted to devising types of semi-hollow cores, of minimum cost, that would properly support the veneer faces and cross

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bands, but none were very satisfactory, for gluing purposes, prior to the development of the pre-glued door "skins." Examples of several of these types of cores are shown in Fig. 3.

Door Skins for Flush Doors

The development of the idea of pre-glued door "skins" was the step needed to make flush doors with semi-hollow cores an unqualified success. Door sizes for homes are well standardized at 6′-8″ in height and 2′-8″ in width, with a small percentage of narrower, and occasionally oversize doors at 7′-0″ by 3′-0″. It proved to be an ideal product for a plywood mill, cutting all veneer 1/24″ plump, using selects for faces, moderate grades for backs (which were concealed), and lower grades for cross bands. Sizes were adequately standardized, so that 90% were of a single size. The ⅛″ 3-ply was soon recognized as an established standard for thickness. Stocks could be built ahead of actual orders, under-runs and over-runs presented no problems. In dull seasons advance stocks could be assembled for anticipated orders. Some plywood factories assign a large proportion of their production to door "skins." Birch faces are the rule, with relatively small ratios of oak, mahogany, walnut and other figured species.

This development of the door "skin" branch of the plywood industry led to another radical change in manufacturing flush doors. With door "skins" available on a competitive basis, and also the importation of low cost door "skins" from Japan and the Scandinavian countries, a number of door assembly plants appeared near large cities, where the suburbs were growing rapidly, and the market for flush doors

was most promising. The machinery for making door frames was relatively simple, and a variety of semi-hollow cores was also on the market. The plywood pressing equipment required very low pressures, since 50 to 100 lbs. p.s.i. calculated on the frame area, not the entire door area, was all that was needed. Moisture resistant adhesives, setting at room temperatures, were to be had in several types. The total investment was moderate, and the market, within the range of truck deliveries, was almost unlimited.

The requirements of contractors for interior doors could be satisfactorily supplied by such local door factories, leaving exterior and weather exposed doors to be furnished by plywood producers with hot-pressing equipment using weather proof adhesives.

Semi-Hollow Cores for Flush Doors

The availability of door "skins" and of local assembly plants added new impetus to the making of lightweight and moderately priced flush doors for a multitude of modest suburban homes. As a result a number of semi-hollow door cores were developed, several of which are illustrated in Fig. 4. That at A is a bit crude, requiring slats of uniform width, which can be sprung into place within the door frame. Care should be taken to have no more than 6" spacing between supports. The wider portions of the rails are to provide for mortised lock sets.

That at B is an ingenious method of utilizing waste strips of narrow veneer, of almost any thickness or species, glued together at alternate ends, a sort of accordion construction. When the pack is thus glued at the ends and

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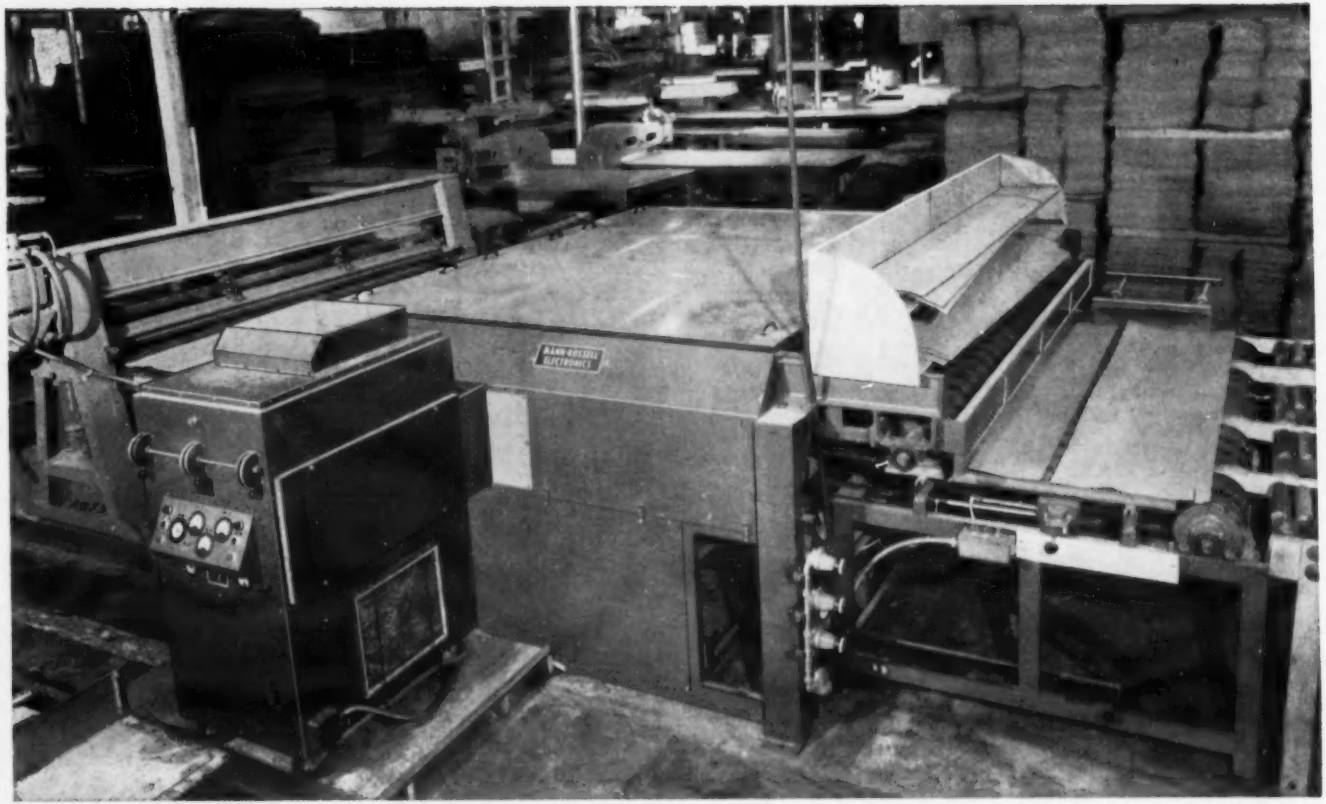

An Electronic Veneer Splicer

Typical installation of Mann-Russell ELECTRONIC continuous flat-plane veneer edge gluer; one of three standard size units. Photo courtesy of CASCADES PLYWOOD CORPORATION, Lebanon, Oregon.

Will Speed Your Production Before You Buy, Be Sure To

ASK THESE QUESTIONS:

veneer edge gluer; one of three standard size units. Photo courtesy of CASCADES PLYWOOD CORPORATION, Lebanon, Oregon.

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while still collapsed, it can be planed to proper core thickness and stored in compact form for future use. When installed in the frame the top layer of veneer is stapled to the top rail and the further layer to the bottom rail. The rails are pulled apart, fitted in the end notches of the stiles and fastened with blind nails. This expansion is done on one face of the door, freshly glue coated, and immediately thereafter the other glue coated face is placed over the assembly with a couple of staples in the trim margin to prevent slippage. The operations of pressing, trimming and sanding follow.

The type shown at C is an early type of semi-hollow core, requiring considerable machine work, and now largely displaced by less costly methods. The inset at D shows a small ventilating aperture, required for possible relief of built-up internal pressures in hot presses for exterior doors.

Another type of semi-hollow core, is the "napkin ring" type, consisting of short sections of tubing, accurately cut to length, sometimes of plywood, but more often of spirally wound fiber board. This type is shown in Fig. 3-M, although the rings can be placed as far apart as their diameters. Any random arrangement is satisfactory.

Honeycomb Paper Cores

The latest type of semi-hollow core is one made of tough kraft paper expanded into hexagons. This type of core was developed during World War II, for airplane floors, partitions, portable containers and the like, where lightweight and sturdiness were of prime importance. Many of these used impregnated paper to meet exacting government specifications for extreme exposures.

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Within the last two or three years this honeycomb core material has been developed* in standard sizes and grades and is arousing much interest in the plywood industry, because of its ready availability, extremely light weight, adequate sturdiness and moderate costs. In order to make this expansion process more understandable to the reader, the initial paper gluing procedure is illustrated in Fig. 5. The bands of glue, spread on the kraft paper to make the collapsed hexagons, are spaced alternately on adjacent layers of paper, and are shown by the heavy black lines in the upper sketch, in which the layers of paper are somewhat separated. After assembling these layers of paper and allowing the glue to harden, it may be expanded into approximately hexagon paper cells, resembling honeycomb, and hence the name.

*By Union Bag-Camp Paper Corporation, Woolworth Bldg., New York City.

The central sketch shows partial expansion, and the lower full expansion. The short diameter of the hexagon, measured in inches, is called the cell size. In the several standard types the weight of the kraft paper ranges, from 70 to 100 lbs. per 3,000 sq. ft., and the cell sizes from 7/16″ to 1⅜″. The paper used for making honeycomb may be impregnated with a phenolic resin for structural purposes under weather exposure, or may be unimpregnated, which grade is well adapted to interior flush doors.

Since we are dealing with the latter in this article, further data will apply to 80 lbs. unimpregnated paper with a cell size of 1⅜″. This material, fully expanded, weighs about 2/3 lbs. per cubic foot, or approximately one ounce per board foot, and is priced at 3c or less per board foot, depending on size and quantity. The contrast in weight with yellow poplar or white or sugar pine at 2 lbs. per board foot is striking, as is the cost factor.

This material is available in unexpanded "slices" of suitable size to expand to a full height door, varying in width from 1′-6″ to 3′-0″, and providing an expanded core about 1⅛″ thick. The slices, obviously wider before expansion, are foreshortened during expansion, as can be noted in Fig. 5.

The use of these honeycomb cores for flush doors is illustrated in Fig. 6. The top and bottom rails of wood are glued to the unexpanded slice of honeycomb and drawn apart so that the rails fit in the notches of the stiles, and are blind nailed at the corners. The glue is usually spread on the in-

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side of the bottom door "skin," and the frame members and core assembled on the freshly glued surface, followed by adding the other door "skin" with glued surface downward. The thickness of the honeycomb core should be slightly greater than the frame of the door, so that the ends of the paper cells may be slightly bent over to increase the gluing area. Extensive tests have shown that flush doors with honeycomb cores are entirely satisfactory, both for strength and durability.

The assembly process for impregnated honeycomb requires some additional steps to cure the impregnant, and must be bonded in hot-presses.

Cut-Outs in Flush Doors

If cut-outs for glass are to be made in flush doors with semi-hollow cores, it is necessary to provide suitable framework in the core, so that the necessary moldings can be bradded around the openings. Several such arrangements are shown in Fig. 7. The dotted lines suggest suitable frame members set in the cores. In flush doors with solid pine cores such supplementary frame members are not needed.

Popularity of Flush Doors

The statistics of flush doors are quite astounding. In 1940, when continuous block pine cores were used, flush doors accounted for only 5% of the American stock door volume. In 1948 flush doors, and by then some of them were of the semi-hollow type, were 10% of the total. In 1953 the flush door business had skyrocketed to 58% of all doors made in this country. Reported figures now indicate manufacture of more than 13 million flush doors per year.

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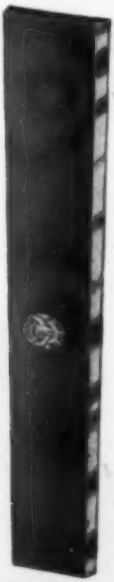

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Melamine has excellent washability. It may be used immediately after urea-formaldehyde resin without a cleanup. LAUXITE MF-300 is furnished as a dustless powder and can be easily formulated to meet *both* minor and major durability problems.

LAUXITE MF-300 bonds meet military as well as rigid civilian specifications. This resin is recommended as a straight adhesive (for either hot press or radio frequency gluing operations) or for upgrading urea formulations.

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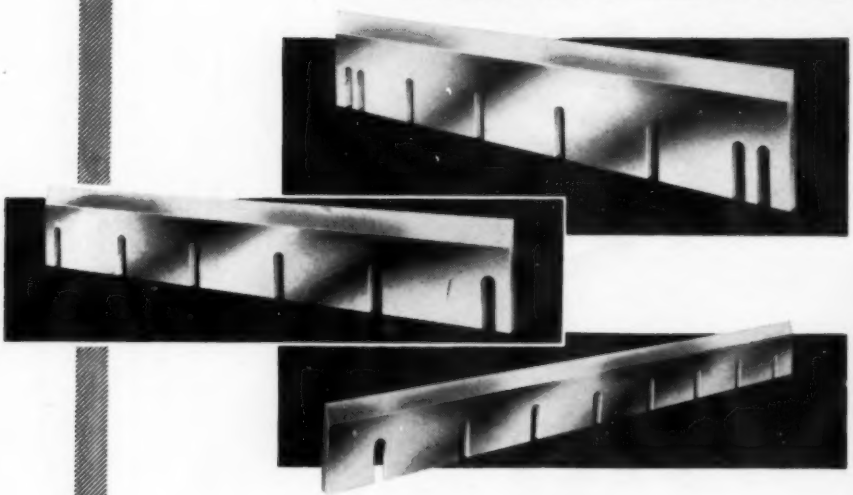

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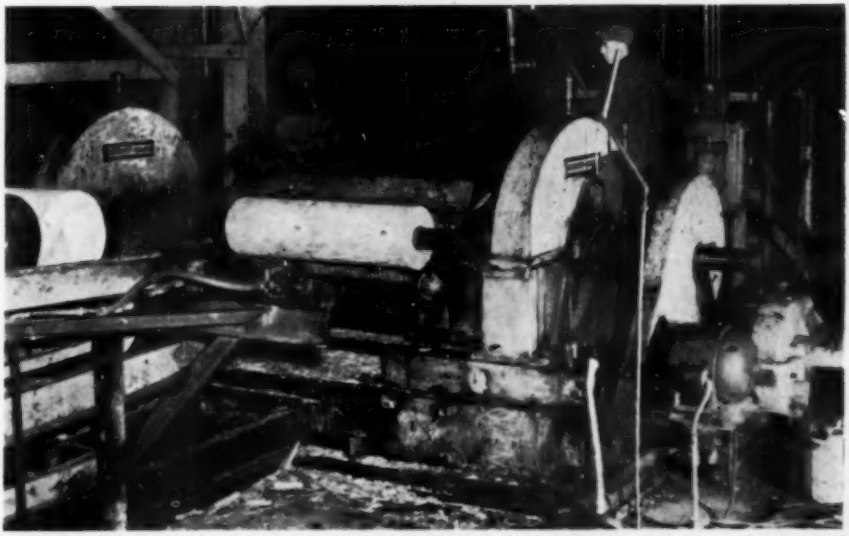
Avoiding Overcut on Veneer Orders



Looking at the log side of a competent rotary lathe, operating in the plant of Long-Bell Lumber Company, Gardiner, Oregon. Photograph courtesy Merritt-Solem Division, Solem Machine Company, Lockport, New York.

ONE important phase of rotary cutting veneer has to do with the amount of any given type of material it is safe to cut ahead. This is especially true in plants where it is possible to run a long way ahead on orders. In some places, it is perfectly safe to cut almost any amount of veneer ahead on the particular type of stock being handled. In other mills, where chiefly custom orders are filled, quantities must be closely watched. One reason is that customers for veneers and plywood panels watch their own shipments closely, to maintain a low inventory.

Therefore, if a veneer mill cuts too heavily on stock for which there is not an ample present market, a definite cutting loss must be absorbed, equal at least to interest on money tied up in an unnecessarily large inventory. Obviously, going too far along this line can cut into the profits of a veneer plant seriously. Because of this, on any specific type of veneer being cut to given thickness and length, in a plant working chiefly on custom orders, the work must be closely watched and controlled if serious over-cutting is avoided.

Many times, when a lathe operator is

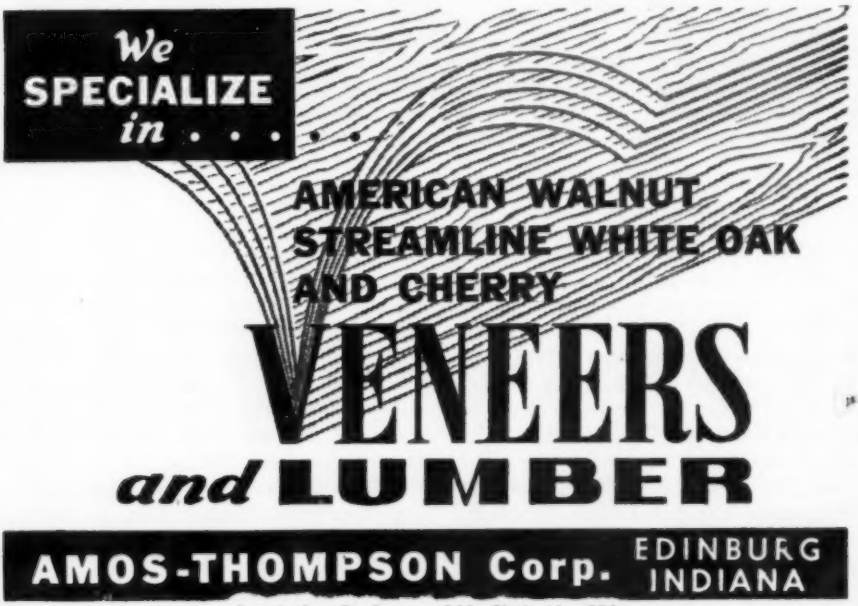
given an order in such a mill, it is a good idea to tell him what width or widths of panels the order is to make, and the number of panels required. If he has this information, he can keep a check with the rough clipper operator as cutting progresses. In fact, this must be done in order to operate safely. Nevertheless, if a shortage develops after the rotary setup has been changed over to another type of veneer, it can be an even bigger disadvantage than a moderate amount of overcutting. The best thing is to cut enough over to be absolutely sure of filling the order, but no more than that.

Thinking further along the same line, when a given panel order is roughly billed, it is wise to first check it against any over-cuts that may have been made previously on other runs, and left in stock. If the plant already has veneer of proper species, length and grade, that can be worked in on the order, it should be deducted from the amount on the order to begin with.

Mill foremen often find it good practice to give the rough clipper operator a copy of the same sheet of instructions as the one which goes to the lathe man. When this is done, the primary responsibility rests in the hands of the rough clipper operator. The lathe operator may dismiss quantity from his mind completely until he is told by the rough clipper man that the point is being closely approached where they will have enough material for the order.

This is the final test of a gentleman: his respect for those who can be of no possible service to him.

—Wm. Lyon Phelps



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GLUING MACHINES SPEED PREFAB MANUFACTURE

Through use of modern, high-production woodworking machinery and equipment, National Homes Corporation, Lafayette, Indiana, has completed its 100,000th prefabricated home.

Typical of National Homes' production methods is a high-speed gluing setup for spreading glue on kitchen cabinet door frames. This company uses a Model 35 glue machine manufactured by The Union Tool Corporation, Warsaw, Indiana, in processing more than 1500 high-grade fir frames per eight-hour shift, the frames going through the machine's rollers two at a time. Coming in a variety of sizes, the frames are fed into the glue spreader by one man while four men tail the panels.

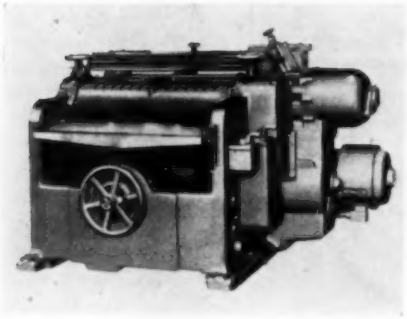
Another machine aiding National Homes' production is a Union Roller Coater used for painting various items. National Homes has found that the roller coater performs faster than spray-painting equipment, provides a smoother coat and greatly reduces paint loss.

For additional information on Union glue spreaders and other coating machines, write to The Union Tool Corporation, 913 N. Detroit St., Warsaw, Indiana, and request Roller Coater Bulletin.

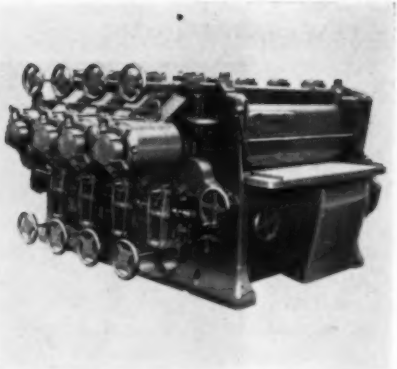
SMALL SAWMILLS SELF-HELP IMPROVEMENT PLANNED

Because many small sawmills badly need to modernize equipment, maintenance and production methods, North Carolina State College and the Saw Division of R. Hoe & Co., Inc. have announced joint sponsorship of a research program to improve small mill efficiency and profits. Hoe is underwriting a $5,000 graduate fellowship for the study at the college's School of Forestry, where the project will be conducted. The Hoe Company makes saws, cutterheads, machine knives and allied equipment for the wood-cutting industries. Funds for the program also will come from the Southeastern Forest Experiment Station, the North Carolina Agricultural Experiment Station and the School of Forestry.

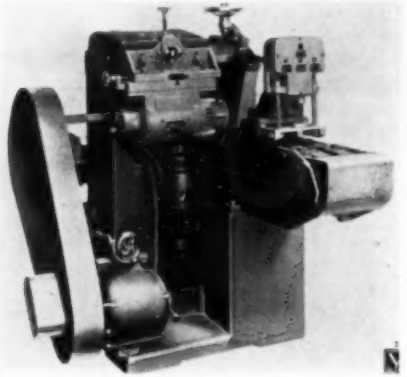
A recent survey in North Carolina revealed that low profit margins resulted in a 10 per cent small mill ownership turnover each year. Some lumber industry authorities have estimated that half of all lumber manufactured during so-called "normal times" is produced at a loss.



Greenlee No. 110 single surface planer.



Double deck sander, 8 drum, S-800, by Yates-American.



Yates-American finger jointer, E-10.

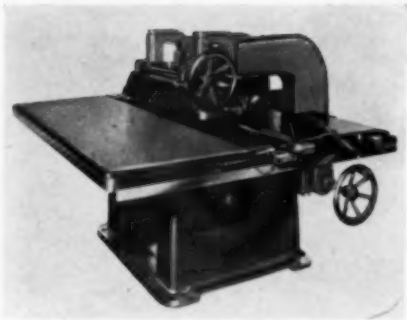
Mattison No. 202 straight line ripper will be demonstrated under power.

Machines

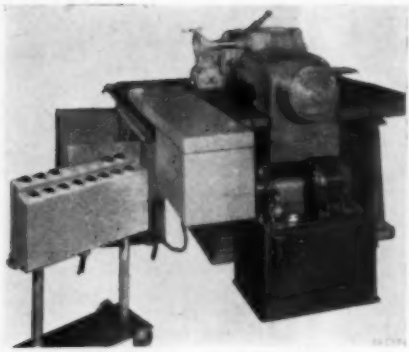
"How to Get the Most

PLANT visits and machine demonstrations will be among the highlights of the fall meeting scheduled for the Midwest Section of the Forest Products Research Society. Choosing the theme, "How to Get the Most Out of New and Existing Woodworking Machinery," the meeting has been planned for October 24-25, at Hotel Faust, Rockford, Ill. General Chairman is Walter Hagstrom of Mattison Machine Works. Attendance at this meeting will probably reach more than 300.

The meeting will emphasize the newest and latest woodworking machinery, which will be demonstrated in actual operation at the following Rockford area places: Ekstrom Carlson Co.; Greenlee Bros. & Co.; Mattison Machine Works; Solem Machine Co. (all Rockford plants); and Yates-American, Beloit.



Ekstrom-Carlson model M glue line rip saw. Design insures that stock will be carried past the saw blade in a straight line.



Preselect width saw gauge on Mattison No. 202 straight line ripper. Machine will be demonstrated under power. This unit is designed for straight line ripping of predetermined widths.

s In Motion...

st Out of New and Existing Woodworking Machinery"

Technical sessions on the subject of new developments in woodworking machinery and maintenance will be held on both mornings of the meeting days. Plant visits will occupy the afternoons, with meeting attendees being provided with transportation to and from these plants.

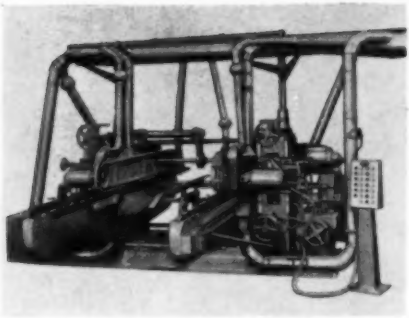
Machines to be demonstrated will include molders, double-end tenoners, drum sanders, stroke sanders, straight line rip saws, planers, finger jointing machines, and a number of others.

Ekstrom-Carlson will have its complete line of woodworking machines exhibited under power at their factory. Among the machines in actual operation will be the new style 6" and 8" molders, the model M and MM glue line rip saws, and a complete new pneumatically operated direct line cut-off saw.

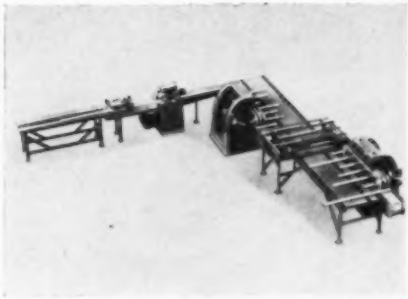
Greenlee Bros. & Co. will demonstrate in action the Greenlee No. 110 single surface planer, the No. 545 double-end tenoner, and the No. 431 roll feed rip saw. They will also have a scale model of their new finger jointing unit on display. The plant has three or four new items in process which may be completed and ready for operation at the time of the meeting.

Woodworking machines to be demonstrated at the Mattison Machine Works will include; No. 202 straight line ripper and the pre-select width saw gauge; No. 276 fast feed electric molder; No. 229 electric molder; and the No. 303 automatic stroke sander. Mattison also has several other new models "under wraps" which will be demonstrated.

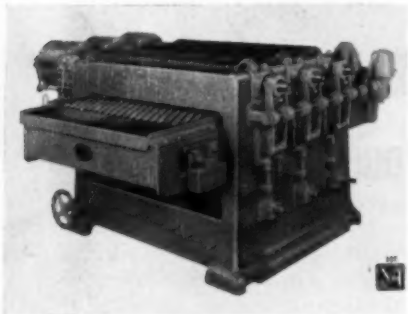
Solem Machine Co. will demonstrate



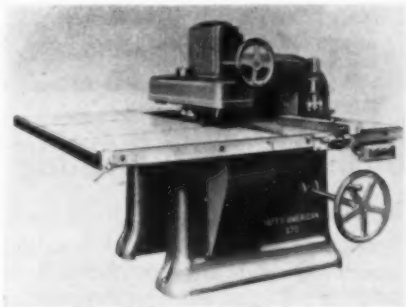
Greenlee double end tenoner with pedestal control. This machine performs many operations, including dadoing, scoring, dovetailing, notching, relishing, sill-horning, irregular shaping and other types of work.



Greenlee finger jointing unit. This unit handles random stock lengths from a minimum of 6" and a thickness up to 2". Consists of traveling cutoff saw and outfeed table, assembly machine and a left-hand finger joint machine with glue spreader and side conveyor.

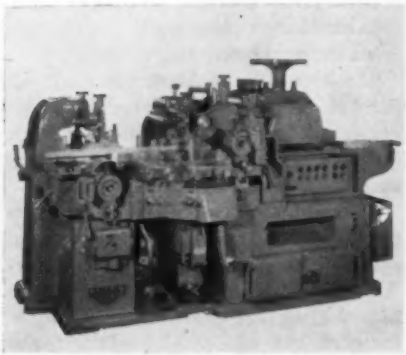


Yates-American endless bed sander, S-333.



Yates-American straight line rip saw, G-70.

Mattison No. 229 electric molder is built in three sizes for handling stock up to 6" wide, 8" wide, or 10" wide by 4" thick.



Mattison No. 276 electric molder which will be equipped with tapered spindles and demonstrated under power.

NO MORE pinched fingers

Wabash

SELF-RELEASING DROP LEAF SUPPORT

SMOOTH, SIMPLE ACTION

EVERY WOMAN who owns a table with Wabash Drop Leaf Supports is enthusiastic . . . tells her friends . . . helps you sell more tables. These self-releasing supports are inexpensive, save time and labor, too. They are used by many leading manufacturers who find them an outstanding selling feature. Ask about them.

Ask about Wabash Slides and Folding Leaf Equipment

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B. WALTER & CO., Inc., WABASH, INDIANA

Walter of Wabash

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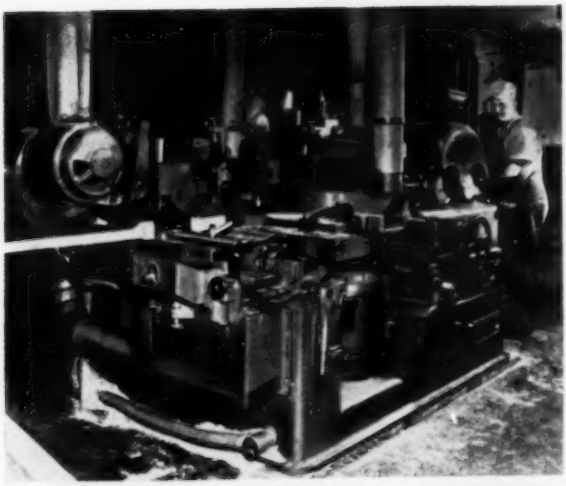
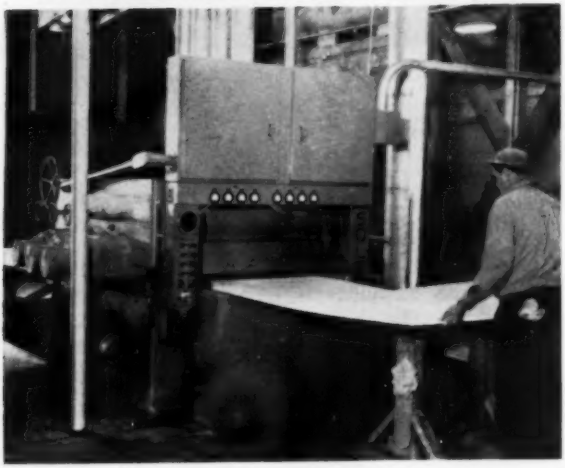


Ekstrom-Carlson No. 468 hi-speed molder. Spindles on machine can be run at any of 3 pre-selectable speeds from 3600 to 7200 r.p.m., without the use of frequency changers.



Solem SR8-8 49" 8-drum double deck sander. This model is also available in six-drum and four-drum types in widths from 43" to 85".

one or more of the following machines; SE7-4 49" 4-drum Solem sander; the SR8-8 49" 8-drum double deck sander; and the 55" 8-drum sander.

Featured at the Yates-American plant visit in Beloit are to be a number of machines used in the woodworking industry which are of current interest because of new applications or new design. Among those demonstrated will be the Yates-American S-800 8-drum double deck sander; the endless bed sander; the E-10 finger jointer; the Yates-American carbide tipped tongue and groove sidehead. Also shown will be the J-120 20" band saw, the Y-1300 30" band saw, the B-244 surfacer, and the B-101 hand jointer.

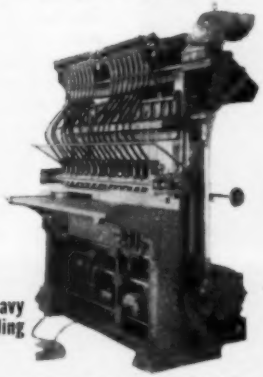
Unlimited

IN APPLICATION

YET ECONOMICAL THRU SIMPLICITY IN DESIGN

The "DOIG"

SPECIAL PALLET NAILING MACHINE



DOIG Special Heavy Duty Pallet Nailing Machine

DURABILITY . . . assures years of trouble-free operation.
Automatic compensating mechanism for clinching different nail sizes.
Heavy duty self-aligning roller bearings drive nails evenly.
Solenoid tripping action; individual motorized drives for table raising, pan oscillating, and main drive operations.
This machine is equipped with an individual track control self-contained feeding unit.
It is capable of driving 16 and 20 penny nails into hard wood.
Can be modified for specific nailing requirements.

DOIG

WILLIAM S. DOIG, INC., HAVERSTRAW, NEW YORK

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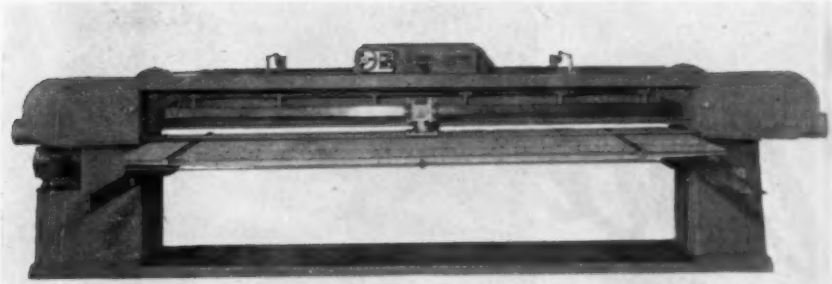
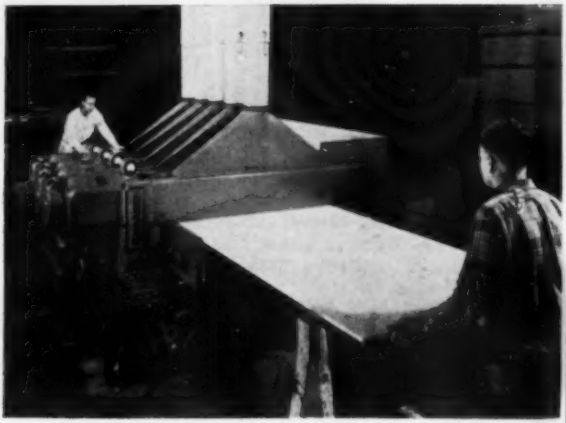


Mattison 12" automatic stroke sander with stabilized stroke, for finishing large flat surfaces such as panels and doors. Double belt model with coarse belt for removing tape and glue and fine belt for finish sanding.

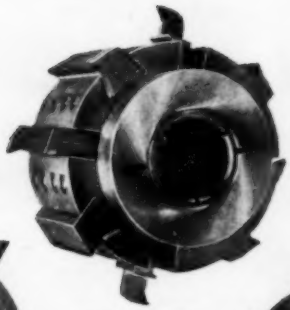
Ekstrom-Carlson No. 112-A oscillating edge belt sander. Main feature of this machine is the arrangement whereby the belt and back platen oscillate up and down in synchronism.



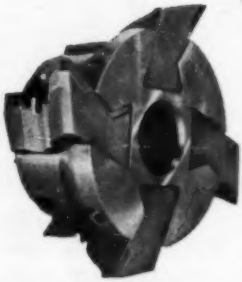
Solem SE7-4 49" four drum sander.

Increase Production

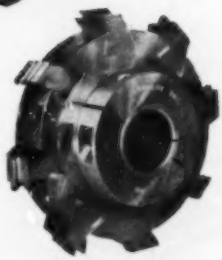
Cut Costs



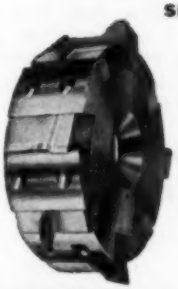
MOULDERS



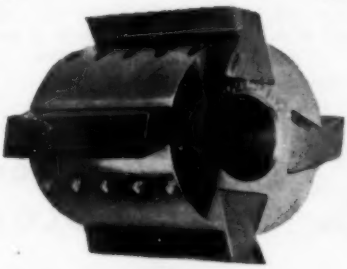
SHAPERS



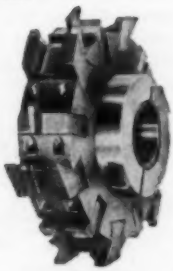
MATCHERS



TENONERS (COPE)



JOINTERS



MOULDERS

THE MARCOLOY CARBIDE SYSTEM

insures the successful use of carbide tools on many different jobs.

The system starts with the right design of carbide knives (and cutter heads) for the machine, the cut, the feed, the stock.

Marcoloy tools are precision made. But Marcoloy goes further—the right production, maintenance and sharpening procedures are developed.

Briefly, that's the complete Marcoloy Carbide System.

You may have our recommendations for the asking. Send for catalog.

MARCOLOY CARBIDES

MARCOLOY, INC.
Springdale, Conn.

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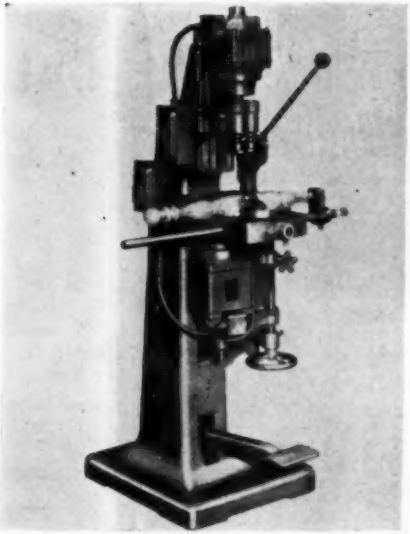
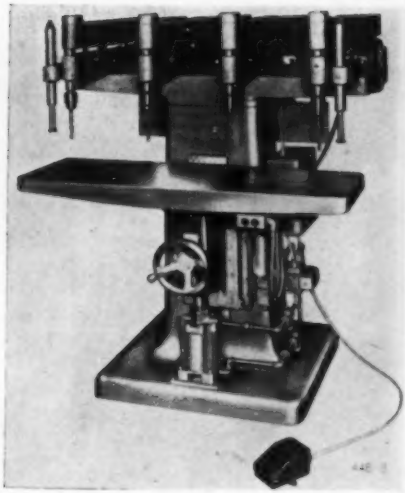
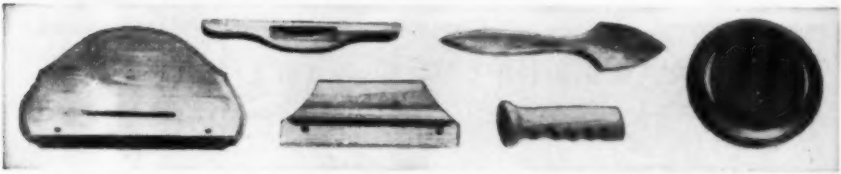


Ekstrom-Carlson No. 167 bed lock machine. Grooves and bores bed posts or rails in one operation.



Ekstrom-Carlson No. 448 multiple spindle borer. Actually four individual-drive boring units on one frame, with provisions for a wide range of positioning adjustments for the four spindles.

"IF YOUR PRODUCT USES HARDWOOD PARTS SEE HOLGATE FIRST"



Your complete wood parts requirements can be supplied in the exact dimensions and any quantities specified. Holgate Brothers Company has the newest in kiln and drying equipment, with properly engineered drying rooms, and large, dry storage buildings, in addition to large complements of woodworking machinery. Parts are completely machined and finished . . ready for assembly.

WWD-10-6

Your inquiry and specifications will receive our prompt attention

HOLGATE BROTHERS COMPANY
KANE, PENNSYLVANIA

HOLGATE SINCE 1789

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1956 FALL MEETING

MIDWEST SECTION

FOREST PRODUCTS RESEARCH SOCIETY

ROCKFORD, ILLINOIS **OCTOBER 24-25, 1956**

TUESDAY, OCTOBER 23, 1956	
5:00 PM to 9:00 PM	Registration—Hotel Faust.
WEDNESDAY, OCTOBER 24, 1956	
8:00 AM to 9:00 AM	Registration.
9:00 AM to 9:30 AM	"MAPI Method of Equipment Analysis"—A scientific approach for determining the right time for equipment replacement.
9:30 AM to 10:00 AM	"Cost Reduction"—How to raise the Woodworking Industry's Annual Improvement Factor through proper utilization of new and existing machinery, tools, and equipment.
10:00 AM to 11:30 AM	Panel Discussion—"What is new in woodworking machinery"—presented by representatives of machine manufacturers.
12:00 Noon to 1:00 PM	Official Luncheon—R. C. DuBrucq, guest speaker.
1:00 PM to 5:00 PM	Machinery Demonstrations—At the plants of the manufacturers. Transportation will be available, on schedule, to Ekstrom-Carlson, Greenlee Tool, Mattison Machine Works, Solem Machine Company, and Yates-American.
5:30 PM to 7:30 PM	Paul Bunyan Hour—Hotel Faust.
THURSDAY, OCTOBER 25, 1956	
9:00 AM to 9:20 AM	"Safety in Woodworking Machine Operation."
9:20 AM to 9:40 AM	"Maintenance of Woodworking Machinery."
9:40 AM to 10:00 AM	Electro-dynamic Balancing of Cutter Heads.
10:00 AM to 11:30 AM	Panel Discussion—"What is needed in Woodworking Machinery"—presented by a group of experts representing the furniture, millwork, plywood, and prefabricated housing industries, to be followed by a discussion from the floor.
11:30 AM to 12:00 Noon	Midwest Section Business Meeting.
12:00 Noon to 1:00 PM	Lunch
1:00 PM to 5:00 PM	Machinery Demonstrations.

FRIDAY, OCTOBER 26, 1956

Special machinery demonstrations, by appointment only with manufacturers.

DRYING SAWDUST...

The Suspension method

By S. E. Corder, C. O. Morris, G. H. Atherton

One of the problems involved in using sawmill residue has been how to find an economical, high-capacity method of drying the residue. Solution for this problem may be found in suspension drying. Experiment was performed at Oregon Forest Products Laboratory.

MOST of the present suspension driers for wood particles are used for drying material used in making wood briquets. In recent years, increased use of sawmill residues for briquetted fuel, particle board, hardboard, and molded products has stimulated interest in an economical, high-capacity drier for wood particles. Most consolidated wood products require wood particles dried prior to manufacture. Where dried wood particles are required, suspension drying could be used.

Another possible application of the suspension drier is in drying of wood-waste fuel for steam boilers. Here, waste stack gas could furnish heat for the drying operation. Removal of the drying process from the boiler furnace would result in higher steam-generation capacity for the plant, as well as higher plant efficiency. West Coast hemlock sawmill residues, for example, often contain so much moisture that boiler capacity and efficiency are reduced seriously. In fact, sawmill operators often must discontinue lumber drying or other steam-consuming operations when hemlock is the only boiler fuel available. Predrying the fuel could eliminate this problem.

Although several suspension driers are being used to dry sawdust, a literature search revealed little published information that could be used for design. Accordingly, this study was instigated to provide needed information. The effects of the following variables were determined for suspension drying of sawdust: (a) gas-inlet temperature (b) gas-flow rate, (c) sawdust feed rate, (d) sawdust initial moisture, and (e) sawdust-particle size.

Principles

Drying is essentially a heat-transfer process, therefore the general heat-transfer equation, $Q = UA\Delta t$, is applicable. The suspension drier has a high heat-transfer rate because: (a) high gas temperature results in a high value for Δt, the temperature difference between material being dried and the heated gas, (b) the contact area A, of the particles being dried is a maximum since the particles are completely exposed to the drying gas, and (c) the over-all heat-transfer coefficient U, is numerically large because of a high relative velocity between the drying gas and particles. Since all three items in the general heat-transfer equation are large, the heat-transfer rate Q, is high.

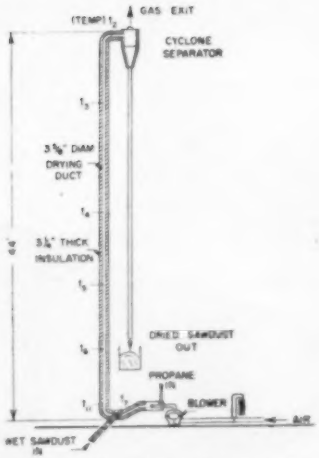

Figure 1. Experimental suspension drier for sawdust.

In the drying system, heat is added to the incoming air at the burner. This heat will:

1. Increase the heat content of water evaporated from the wood.
2. Increase the heat content of water remaining in the wood.
3. Increase the heat content of wood material.
4. Be discharged in the exhaust gases.
5. Be lost by radiation.

Figure 2. Lower section of suspension drier.

Figure 3. Upper section of suspension drier.

Only that portion of heat which evaporates water, item 1, was considered as useful. Therefore, drier efficiency was defined as the heat used to evaporate water divided by the total heat added. Total heat added was determined from the weight flow rate, specific heat, and temperature rise of the gas.

It might seem that a heat-sensitive material such as sawdust could not be exposed to temperature as high as 1200 F. However, the sawdust particle contains moisture upon entering the gas stream and the particle tends to stay at the adiabatic saturation temperature of the gas, which is below 212 F., until the moisture is evaporated. Heat for evaporating moisture must come from the gas, thus lowering the gas temperature. By the time moisture is removed from the particles, the gas is at such a low temperature that there is little tendency to char or burn the wood.

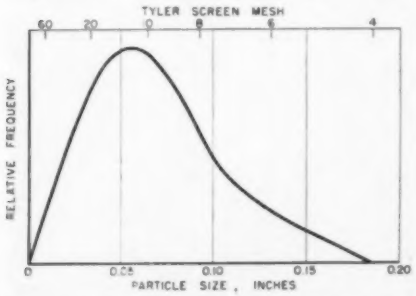

Figure 4. Typical particle-size distributor, by weight, of sawdust used in suspension drying tests.

Particle size is important in the performance of a suspension drier. The time required to heat a particle to a given condition varies as the square of the particle diameter. This factor limits practical application of suspension or flash drying to material of relatively small particle size. The drying rate of wood is governed by heat transfer rather than diffusion when the wood is less than ¼ in. thick. Heat transfer, therefore, is the controlling factor in suspension drying.

The difference in time required to heat various-size particles indicates that small particles would become drier than large particles. However, the small particles move through the system at higher velocities and have shorter contact times than do larger particles. The differences in contact time equalize somewhat the moisture contents of particles of various sizes. There are two forces acting on the particle in the drying duct, gravity and fluid drag. The weight of the particle acts downward while the fluid drag acts upward in the direction of gas flow. A wood particle ⅛″ in diam. requires a gas velocity of about 500 f.p.m. when the fluid drag is equal to the particle weight, but a particle ¼″ in diam. requires a gas velocity of about 1200 f.p.m. for the two forces to be equal.

Maximum Power in Minimum Space

IMPERIAL Motor Arbors

Wide Range of Sizes Beginning at 2 H.P.

No wasted power, no belt drives or extra arbors to buy and maintain, the Imperial Precision Motor Arbor is complete, ready for the saw blade — ready to provide maximum rated power at the blade. The heavy, rigid shaft runs without end play in sealed, pre-lubricated precision bearings, insuring precision cutting and longer blade life. The small housing diameter permits greater depth of cut. Large taper mounted collars grip the blade securely to eliminate slippage.

The Imperial Motor Arbor has totally enclosed fan cooled construction. Air drawn in at end opposite the blade bathes the stator core in a cooling air stream keeping operating temperatures low. It is completely self cleaning with no covers or other dust catching traps. Fan and fan cover are non-sparking.

The Imperial Precision Motor Arbor can be used without saw collars for grinders, cutter heads and other applications. In fact, wherever space is at a premium Imperial Motor Arbors deliver full rated H.P. at point of use, with maximum efficiency and minimum care.

Since 1889

THE Imperial ELECTRIC CO.

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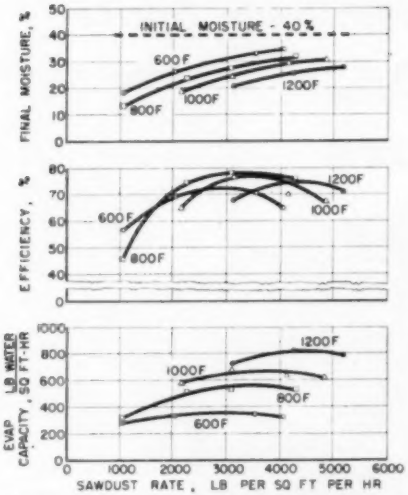


Figure 5. Drier performance at 4180 lb. of air per sq. ft. per hour.

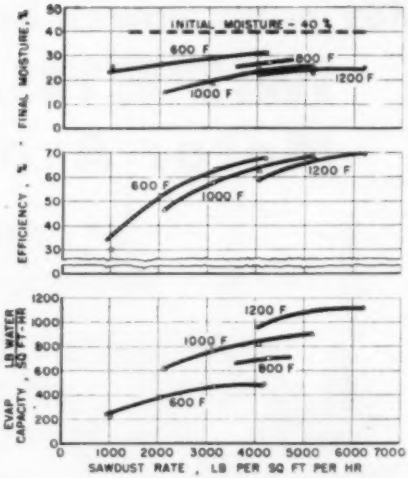


Figure 6. Drier performance at 6130 lb. of air per sq. ft. per hour.

Thus, the time that a particle is in the drying duct is shorter for small particles than for larger particles. Since the larger particles require a longer time to be heated, the difference in contact time results in particles of more uniform moisture content.

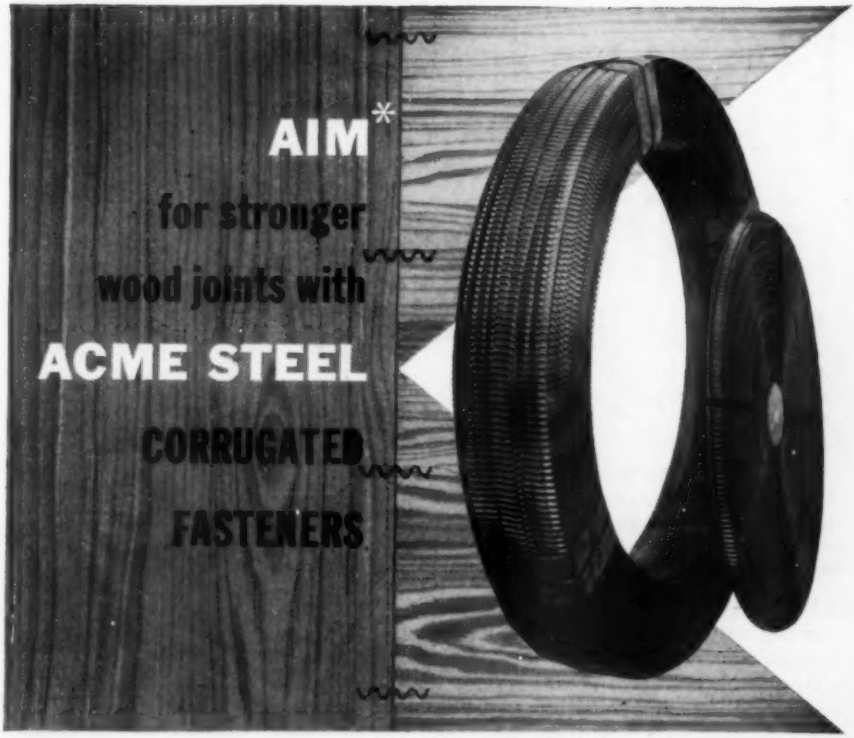
Test Equipment

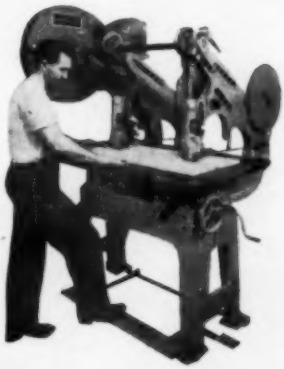
Fig. 1 is a sketch of the system used for the sawdust-drying tests. Air was supplied by a positive-displacement blower. From the blower the air flowed to a propane burner. Temperature of the gas leaving the burner was controlled by regulating burning rate of the propane. Hot gas leaving the burner entered the base of the drying duct where sawdust was introduced by a screw feeder. Drying of the sawdust took place as the sawdust was conveyed upward through the drying duct. The drying duct was a pipe with a 3⅜" ID, about 45' in vertical height, covered with insulation 3¼" thick. At the top of the drying duct, the dried sawdust was separated from evaporated moisture and cooled gases by a cyclone separator 24" diam. Figs. 2 and 3 are photographs of the drier installation.

Effect of Gas Flow Rate

Drier performance at a gas flow of 4180 lb. per sq. ft. per hr. is shown in Fig. 5. Drier performance at a gas flow of 6130 lb. per sq. ft. per hr. is shown in Fig. 6. Sawdust used in the tests has the particle-size distribution shown in Fig. 4 and was at an initial moisture content of 40 % (wet basis). All rates were reported on a basis of square foot or duct cross-sectional area to make the results more generally comparable.

A duct about 13½" dia. has an area of 1 sq. ft. This, the numerical rates shown by the graphs are rates that would be expected for a drier duct of 13½" diam. However, the 3⅜" test duct had a cross-sectional area of approximately 1/14 sq. ft.





...for high-speed fastening on modern power-driven machines.

Joining wood on large volume production lines is quick work when coils of corrugated fasteners are used.

Coils of Acme Steel Corrugated Fasteners make it possible to combine high-speed production methods with strong reinforcement of wood joints. Sharp edges permit easy driving across, with or at an angle to the grain. Your *Acme Idea Man will gladly give you complete information on sizes of coils, depth sizes, types of edges. Ask him to recommend the type of corrugated fastener that will improve the quality and speed of your production. Or, write Acme Steel Products Division, Dept. WEC-106, Acme Steel Company, 2840 Archer Avenue, Chicago 8, Illinois.

ACME STEEL **CORRUGATED FASTENERS**

See Action Card, page 160, Circle No. 299

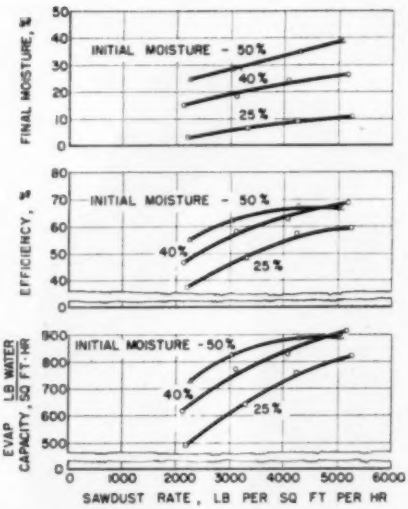


Figure 7. Effect of initial moisture on drier performance with 6130 lb. of air per sq. ft. per hr. and 1000 F. gas.

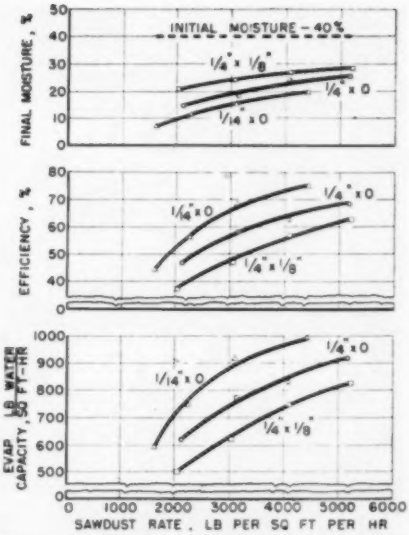


Figure 8. Effect of particle-size on drier performance with 6130 lb. of air per sq. ft. per hr. and 1000 F. gas.

Efficiency, as mentioned previously, was defined as the heat going to water evaporated divided by the total heat added. Moisture content was reported on the wet basis in all cases. Experience with the sawdust being dried indicated that air rates lower than 4180 lb. per sq. ft. per hr. would cause inadequate carrying velocity of the gas and consequent plugging of the drying duct. This factor influenced selection of the lowest air rate at 4180 lb. per sq. ft. per hr. Gas velocity at 4180 lb. per sq. ft. per hr. and 600 F. is 1870 f.p.m.

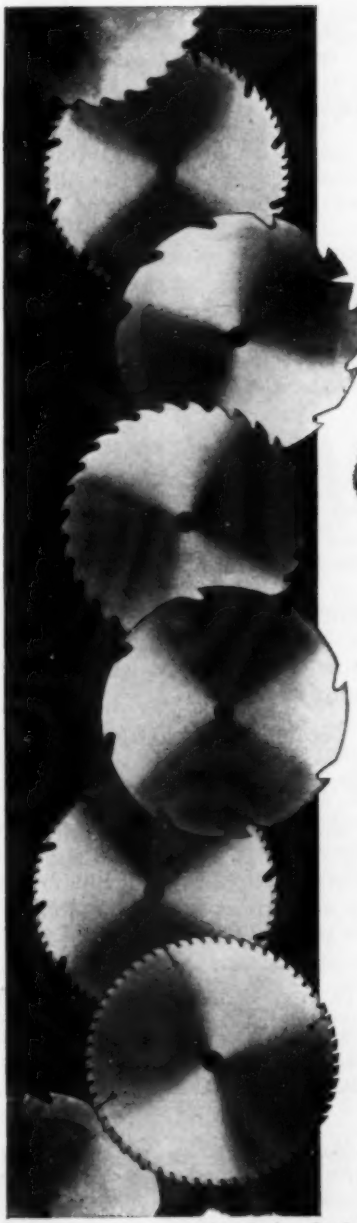
A comparison of Figs. 5 and 6 shows that higher efficiencies were obtained with the lower air velocity or air rate. Tests at higher air rates than reported in Figs. 5 and 6 showed further reduction of efficiencies, indicating the lowest air rate was the most desirable. At a rate per square foot of duct area per hour, of 4180 lb. of gas at 800 F. and 3000 lb. of sawdust, maximum efficiency of 78% was obtained. At the point of maximum efficiency, sawdust was dried from 40% to about 28% moisture content. Lower final moisture contents were obtained, but with lower efficiencies.

Effect of Temperature

There was no marked difference in maximum efficiencies obtained at the various initial gas temperatures as shown by Figs. 5 and 6. Drier capacity, however, increased with higher initial gas temperature. An increase in initial gas temperature from 600 to 1200 F. more than doubled the maximum evaporative capacity of the drier.

Effect of Initial Sawdust Moisture

The effect of initial sawdust moisture content on performance of the drier at an air rate of 6130 lb. per sq. ft. per hr. and an initial gas temperature of 1000 F. is shown in Fig. 7. Highest



More production...more profit
more accurate cuts

ATKINS

CARBIDE-TIPPED SAWS

for every woodworking plant!

Atkins Silver Steel carbide-tipped circular saws are manufactured from the finest steel available . . . Atkins Silver Steel, designed and made with the experience received from one-hundred years of quality saw manufacturing. Atkins saws are production time-savers—making faster cuts—more accurate cuts—lasting many times longer between sharpenings.

Atkins Silver Steel carbide-tipped circular saws are available in a size and tooth for every job. If you are looking for methods of increasing production and profits—look to Atkins.

you can't buy experience . . .
but you can buy the result:
. . . buy ***ATKINS***

ATKINS SAW DIVISION

Borg-Warner Corporation • Indianapolis 9, Indiana

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See Action Card, page 160. Circle No. 291

efficiency, 68% was obtained with sawdust that had an initial moisture of 40%. Slightly lower efficiencies were obtained with sawdust at 50% initial moisture, and sawdust at 25% initial moisture gave the lowest efficiency. It should be noted, however, that efficiencies were still rising with increased sawdust rate for sawdust at 25 and 40% initial moisture, but had reached maximum efficiency for sawdust at 50% moisture.

An examination of Fig. 7 shows the benefit of drying in stages with the suspension drier. When drying from a high to a low moisture content, higher efficiency would be obtained by drying in two, or perhaps more, stages. It was found possible to dry from a high to a low moisture content with only one drying duct by mixing part of the dry output with the high-moisture incoming material. This procedure gave an intermediate moisture content for the mixture of recirculated and new material entering the drying duct. It was found that the moisture content of the mixture could be regulated by the proportion of dried to wet material, introduced into the system.

Effect of Particle Size

Most test runs were made with mill-run Douglas-fir sawdust screened through a 4-mesh screen. A typical particle-size distribution of the sawdust is shown in Fig. 4.

The effect of sawdust-particle size on performance of the drier at an air rate of 6130 lb. per sq. ft. per hr. and an initial gas temperature of 1000 F. is shown in Fig. 8. The ¼" x 0 sawdust was mill-run material that had particle distribution as shown in Fig. 4. The 1/14" x 0 sawdust was the smaller material and contained only those particles that would pass a screen of 1/14" openings. The ¼" x ⅛" sawdust was the material containing particles between ⅛" and ¼" sizes.

As would be expected, the small particles dried more readily, with a drier efficiency higher than when drying the larger particles. For example, in drying sawdust from 40 to 20% moisture with the conditions given in Fig. 8, the large particles (¼" x ⅛") resulted in a drier efficiency of about 38%, while the small-size sawdust (1/14" x 0) would dry to the same conditions with a drier efficiency of 75%.

Conclusions

In the experimental sawdust suspension drier tested, maximum drier efficiencies of 70% to 80% were obtained. Results indicated that suspension drying is a practical and efficient method of drying small wood particles such as sawdust. Close control of the drying process was obtained readily by regulating drying variables.

Optimum gas velocity was found to be the lowest velocity that would convey the particles through the drying duct.

Results indicated that suspension drying should be limited to materials with small particle sizes because drier capacity and efficiency dropped sharply as the particle size was increased.

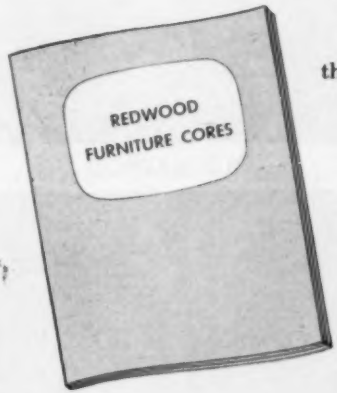
This paper was presented at a spring meeting of the American Society of Mechanical Engineers and is used with permission.

Many a man's idea of charity is to give unto others the advice he can't use himself.

Shop-Grade California REDWOOD

For stable furniture cores

No other commercial wood in America offers the furniture manufacturer more desirable properties for core stock than shop-grade California redwood.



FURNITURE CORE data can be obtained by sending for the Redwood Furniture File.

COMPLETED REDWOOD CORES will be faced with plywood to form artists' and draftsmen's drawing boards.

Light weight, strength, workability, glue-holding power, dimensional stability—redwood has all. And economical shop-grade redwood gives you a maximum of useful lumber at minimum cost. Learn all about redwood for furniture cores by writing the California Redwood Association, 576 Sacramento Street, San Francisco 11, California.

REDWOOD, HERE BEING DOVETAILED, will form ends and sides of drawers in period furniture cabinets.

A clearing house for redwood data, the Association includes fourteen leading redwood lumber mills: Arcata Redwood Co., Eureka Redwood Lumber Co., Hammond Lumber Co., Hollow Tree Redwood Co., Holmes Eureka Lumber Co., Hulbert & Muffly Co., Inc., M & M Wood Working Co., The Pacific Coast Co., The Pacific Lumber Co., Rockport Redwood Co.. Simpson Redwood Co., Union Lumber Co., Warm Springs Redwood Co., Willits Redwood Products Co.

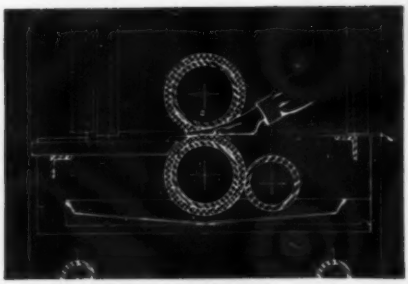
See Action Card, page 160. Circle No. 292

End costly ACCIDENTS in roller coating operations!

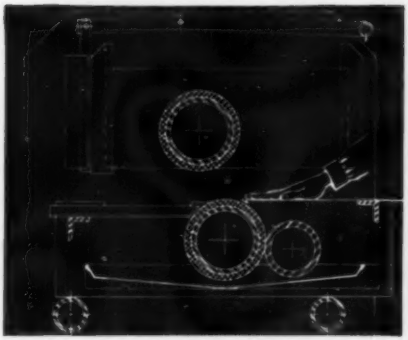
At long last! Now you can have high production coating with *complete safety for your employees* . . . and end costly delays due to accidents.

The new Union Roller Coaters —for the first time in coating machine design—feature a safety device to protect your men from disabling accidents common to coating machine operations.

The new safety feature incorporates a release handle running the full width of the Roller Coater and located immediately in front of the operator. In the event of *any* emergency, the operator hits the release handle. Instantly, the lower roll assembly springs away from the upper one, preventing serious damage or injury to the operator or the machine. After actuation, the rolls can be reset within seconds.



OLD METHOD



NEW METHOD

Upper illustration shows obsolete roller coater and lower shows the Union method incorporating the Exclusive Union Safety Device . . . furnished at no additional cost.

The new safety feature is furnished on all standard heavy-duty Union Roller Coaters *at no additional cost.*

Write today for detailed information on Union's complete line of roller coaters.

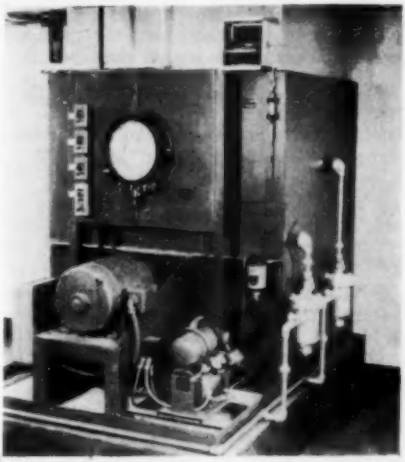
THE
UNION TOOL CORPORATION
WARSAW, INDIANA

See Action Card, page 160. Circle No. 293

EQUIPMENT AND SUPPLIES for the WOODWORKING INDUSTRY

LUMBER DRYING UNIT

A packaged lumber drying machine to speed up and cut the cost of drying lumber and wood products for manufacturers of dimension lumber and millwork and makers of end products has been placed on the market by Orr & Sembower, Inc., Reading, Pa.



Called the Dryalator, the new product is made up of five components—delivered as a packaged unit, completely assembled and ready to put into operation: steam coils; motor-driven air propellor; air return duct system and fresh air intake; steam jet for humidity control; and automatic controls.

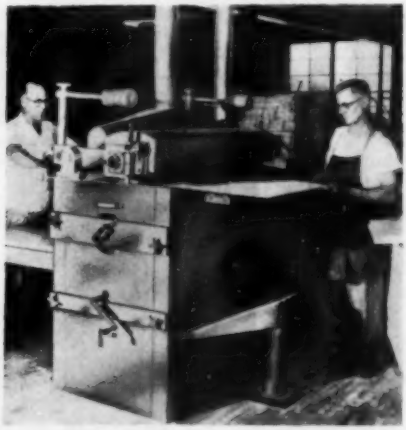
Through closely-controlled and regulated heat and humidity output, the Dryalator makes possible high-speed lumber drying for the small manufacturer.

See Action Card, page 160, Circle No. 1

DUST COLLECTING SYSTEM

A triple dust collecting system has been added to the line of Timesaver "Speedsanders." This system has a large 7" outlet to catch the greatest volume of dust, with a rear outlet for the remainder.

A top outlet keeps the feed roll and wiper roll constantly clean. According to the manufacturer, the three dust collectors set up the proper safeguards for smooth, trouble-free operation at all times. The Speedsander uses abrasive belts.

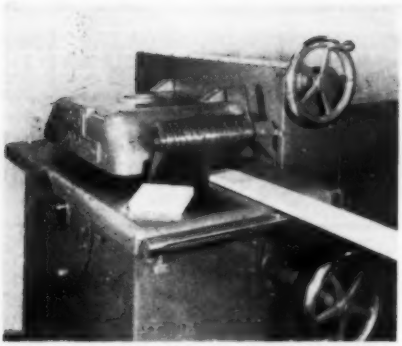


A descriptive bulletin is available from the manufacturer, Timesavers, Inc., 5270 Hanson Court, Minneapolis 22, Minn.

See Action Card, page 160, Circle No. 2

DIEHL MULTI-RIP SAW

A new high-quality multi-rip saw, designated No. 909, has just been an-



Multi-rip saw is specifically designed for high-speed gang ripping of stock as short as 5".

nounced by the G. M. Diehl Machine Works, Inc., Wabash, Indiana, manufacturer of precision woodworking machinery.

Specifically designed for precision, high-speed gang ripping of stock as short as 5", the No. 909 is compact and rigidly constructed, with arbor and arbor motor mounted on the frame. It has an easily adjustable, reinforced table. The table adjusts to a 4" maximum and permits cutting of throat plates in operative position.

The Diehl No. 909 rips stock from ⅛" to 2-½" thick, and from 5" to infinite length. Maximum usable saw space is 10". Yield in the top rows is adequate to compensate for rough lumber. Each row is individually spring tensioned to insure controlled cutting.

Shown is the hinged power feed roll cover, exposing power feed rolls, power spur feed, saw gang and idler rolls. Note dust exhaust hole in cover; adjustable stock gauge; table adjusting handwheel and outboard bearing cover that can be removed.

A complete set of 54 anti kick-back fingers are arranged at the infeed end of the machine, providing maximum kick-back protection for the operator. The kick-back assembly is adjustable with the table to keep the striking angle to the stock constant.

Other outstanding features of the new Diehl No. 909 include minimum lubrication—minimum maintenance; 4 feed speeds, 50-115 f.p.m.; rigid, free from vibration; easily removable saw sleeve and spur sleeve; all upper feed rolls easily removed, enclosed roll drive assembly; 5 powered feed rolls; precision balanced arbor motor; quickly adjustable stock gauge; all controls grouped for easy operation; sealed dust pits.

For complete information on the Diehl No. 909 multi-rip saw, write the G. M. Diehl Machine Works, Inc., Wabash, Indiana. Request Bulletin MRS-909.

See Action Card, page 160. Circle No. 3

FASTENING TOOL

Five thousand staples can be driven continuously from a single cartridge load by the new Load-O-Matic air tacker, introduced by the Swingline Industrial Corporation, a division of Swingline, Inc.

Break-resistant and compact, the plastic cartridge of this pneumatic precision tacker, holds a continuous belt of high carbon fasteners which are air-driven through the pistol-shaped tool by releasing its trigger.

The pneumatic tool, light in weight, is operated and controlled with the use of one hand. It is pistol-shaped and easy to operate. A trigger releases the compressed air which in turn drives each staple.

The Load-O-Matic's construction is such that all moving parts are aligned in a balance permitting its air drive to

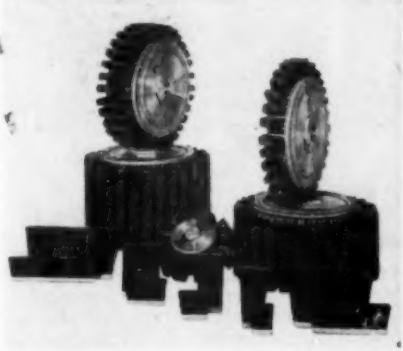
reduce shock and recoil, thereby decreasing operator-fatigue and increasing production.

Additional information from Swingline Industrial Corp., 43 - 32nd Pl., Long Island City 1, New York.

See Action Card, page 160. Circle No. 4

POLISHING HEADS

Something new has been added to the line of Vonnegut brush-backed polishing heads, according to the manufacturer, Grinding & Polishing Machinery Corporation of 2530 Winthrop Avenue, Indianapolis, Ind. These polishing heads will sand, polish, debur, both flat and contoured surfaces on wood, metals and other surfaces. Now, these heads are available with short or long bristle



Announcing . . .

an important get-together

New Hoe expansion—
JONES & ORTH
Cutter Head Division

Hoe has expanded their extensive wood-cutting tool line with the complete line of Jones & Orth cutter heads, form tools and machine knives. Jones & Orth's 33 years of experience are joined with Hoe's 151 years to bring you a most complete and most outstanding wood-cutting tool line known. See Hoe at these complete stocking-service centers:

Mr. Irl R. Walker, Mgr.
2917 Lomb Ave., Birmingham, Ala. Tel: 56-5261

Mr. R. D. Brooks, Mgr.
Carbide Saw & Tool Division, 1809 English St., (Box 1369) High Point, N. C. Tel: 2-3411

Mr. Daniel Beisinger, Mgr.
2700 S. E. Tacoma St. (Box 4695)
Portland 2, Oregon Tel: Belmont 4-9501

Mr. Lew Orth, Mgr.
Jones & Orth Cutter Head Division,
Box 3523, Seattle 24, Wash. Tel: Rainier 7300

Mr. Robert Gottlieb, Mgr.
5203 Leary Ave., Seattle, Wash. Tel: Hemlock 3555

Mr. Robert L. Wilson, Mgr.
Jones & Orth Cutter Head Division, 385 South Main St., Memphis 3, Tenn. Tel: Jackson 5-8212

Mr. Robert L. Ford, Mgr., 400 W. Madison St., Chicago 6, Ill. Tel: State 2-4205

R. HOE & CO., INC.

910 E. 138th St., New York 54, N. Y.

See Action Card, page 160. Circle No. 294

brushes, depending on their application, in the 32, 16 and 12 brush models; and, the 32 brush head is now available in a 1" abrasive width, permitting the operator to get inside the most intricate wood or metal patterns.

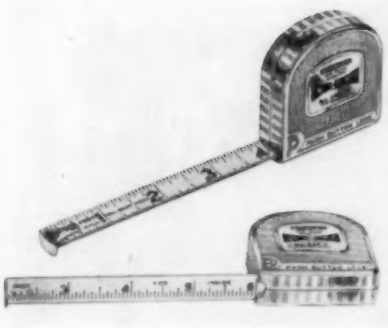
New Bulletin No. 102, describing operation and uses is available from the Company.

See Action Card, page 160. Circle No. 5

"GLIDE-O-MATIC"

New "Glide-O-Matic" steel tape rules with automatic gliding-action blade return have been introduced by Stanley Tools, division of The Stanley Works, New Britain, Conn.

This tape rule for every use also features: a positive push-button lock that holds the tape precisely at desired length; linear calibrations in red on back of tape for inside measurements, and hardened-steel scribers set at case mouth for marking measurements easily and accurately. The elimination of the first 2" of graduations on bottom

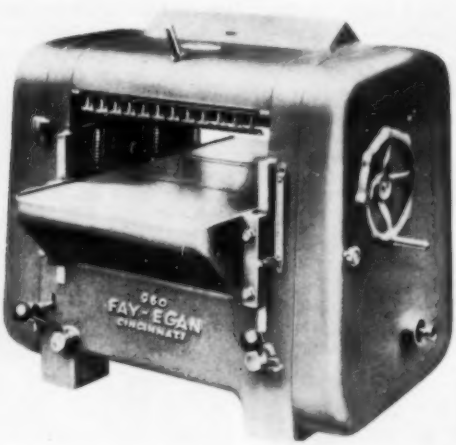


side of tape compensates for 2" case length and provides direct reading for inside measurements.

See Action Card, page 160. Circle No. 6

Additional information on any equipment described in this issue is available. Circle the corresponding numbers on the Action Card, page 160, and return to us.

STREAMLINED SINGLE SURFACER



A streamlined single surfacer is offered by the J. A. Fay & Egan Company. It is the Model No. 960 ball bearing high speed single surfacer, one of the machines in the "900" series line.

This surfacer has many important features for fast, safe, trouble-free operation and long, low maintenance life. The four-knife round safety cylinder is dynamically balanced. A special quick

knife setting gauge allows adjustment in minimum time. The cylinder is powered by a V-belt motor drive and fan cooled, totally enclosed ball bearing motor, 7½ h.p. for the 24" and 10 h.p. for the 32" surfacing width machine.

Feed works are driven direct from the cylinder, with hand levers for engaging or disengaging of feeds. The surfacer has two speeds of feed for each surfacing width: 25 or 36 f.p.m. for 24" width, 33 or 45 f.p.m. for 32" width. Surfacing thickness in either case is 8".

See Action Card, page 160. Circle No. 7

"HANDY" RESUSCITATOR

In critical emergencies, the portable-model "Handy" resuscitator can often avert tragedy. It has proved a lifesaver for those stricken by heart attacks or overcome by suffocation, carbon monoxide poison, electric shock, strangulation and asthma.

The all-purpose "Handy" resuscitator is dependable, simple to operate, and so light that it can be easily carried by one person. As a resuscitator, it automatically inhales and exhales for the patient being treated and automatically adjusts to his lung capacity. As an aspirator, it furnishes sufficient suction to clear water, mucus or vomitus from the throat. As an inhalator, it supplies oxygen to be absorbed by spontaneous respiration.

See Action Card, page 160. Circle No. 8

C.I.T. Terms Available
Write for bulletin and details

JACKSONVILLE BLOW PIPE CO.
Jacksonville, Florida
P. O. Box 3687

The Marvelous Montgomery

BLO-HOG (The only all-purpose hog in the world) Patents Pending

EATS UP EVERYTHING

. . . including Pine, Oak, Gum, Hickory, Elm, Cedar, Wet Veneer and Sandy Bark. Conveyor-fed — no attendant required. Positively protected from major damage by tramp steel. All connections locked — nothing to shake loose. Maintenance costs unbelievably low.

". . . Dear Mr. Montgomery: It is an unbelievable machine and it is still hard to believe that it is actually handling the enormous volume of scrap we are feeding into it. We operate the hog without an attendant—which means a considerable saving." — J. B. BLACK, Ocala Mfg. Co., Ocala, Fla.

Sumner Iron Works, Everett, Washington, W. Coast Rep.
Canadian Sumner Iron Works, Ltd., Vancouver, B.C., Canadian Rep.

See Action Card, page 160. Circle No. 295

SYSTI-MATIC MOLDER

A new larger-capacity model of the Paulson - Systimatic molder has just been announced by Systi-Matic Company, Seattle, Wash.

The new molder, 2"x6" capacity, is available with 4200 r.p.m cutterheads and jointing equipment, or with 8000 r.p.m. cutterheads and oil mist lubrication. With the addition of these machines to their line, Systi-Matic states that they now have molders to offer which will produce 95% of all popular molding patterns.

The high-head-speed machine (8000 r.p.m.) offers special appeal to the shops which run medium quantities of a pattern, or who have special shop or material problems which do not permit jointing. With this machine it is possible to attain very fast feed speeds without jointing, according to the manufacturer.

For shops engaged in high production, the jointing machines offer ability to produce extremely fine quality with consistency and high rates of feed.

See Action Card, page 160. Circle No. 9

NEW SPIRAL CUTTERS

Among the newest high production tools recently introduced by Deluxe Saw and Tool Company is the Karbide King true helix flute design carbide tipped spiral cutters. This design distributes the cutting load uniformly over the full length of the cutting edge. The unique shearing action of these spiral cutters reduces impact.

Surface finishes are improved, and less horsepower is actually needed for operation, according to Deluxe. Karbide King spiral cutters are designed espe-

cially for operation on high speed production in the woodworking, plastics and hardboard industries.

Complete information may be had by writing Deluxe Saw and Tool Company, 510 East Main Street, Louisville, Kentucky.

See Action Card, page 160. Circle No. 10

NEW CASTERS

A new series of casters, with V-grooved track wheels, is announced by the Hamilton Caster & Mfg. Co. of Hamilton, Ohio.

Both swivel and rigid models are offered with semi-steel wheels having accurately machined V-groove to operate on angle steel track. Available in heavy duty semi-steel models with 6" x 2" wheels and extra heavy duty forged steel models with 8" x 2¾" wheels all equipped with roller bearings and pressure grease fittings. Wheels only are also offered. V-grooved wheels can be operated on floor surfaces as well as on tracks.

See Action Card, page 160. Circle No. 11

HAMMER MILL UNLOADS, GRINDS, CONVEYS

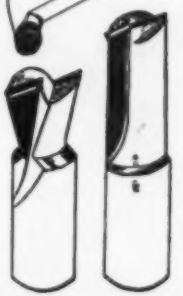
A new heavy-duty hammer mill designed to unload wood shavings from boxcars and trucks, grind the material, and convey it to storage hoppers, all in one operation has recently been introduced. Pregrinding wood shavings prior to storage lessens the possibility of the material bridging as it is discharged

CARBIDE
Heart of Dixie
SAWS
CUTTERS
TOOLS

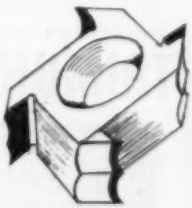
Manufacturing Service One Source

Dependable Sure

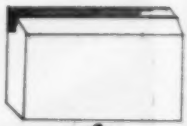
Cutter and saw design experts develop carbide cutting tools to do the best job possible for your particular operation.
All cutting tools are unconditionally guaranteed and custom made to fit specific requirements.



"SPECIALTIES ARE OUR BUSINESS" Write today for details, including information concerning your specific need.

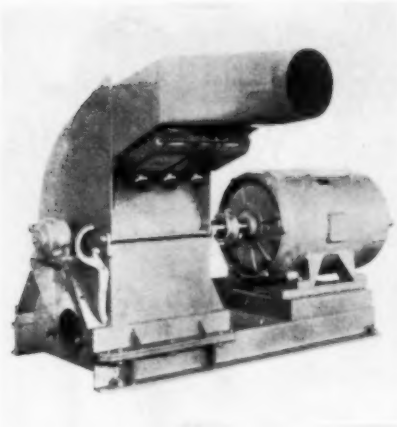


SERVICE
24 hour repair service retipping, sharpening, or complete reworking of any carbide cutting tools and saws. All repairs unconditionally guaranteed.



DIXIE SAW WORKS
1504 EIGHTH AVE., N.
BIRMINGHAM 4, ALA.

See Action Card, page 160. Circle No. 296



from the hopper. This equipment is especially desirable for those companies manufacturing particle board, core board, wood flour, etc.

The feed inlet of the No. 192-A hammer mill is designed to fit a round pipe. This pipe can be either rigid or flexible to aid in sucking the shavings out of various shaped carriers. A powerful fan, with a separate drive, supplies the air velocity necessary to convey the material from the carrier through the grinder, and up into the hoppers. This total conveying distance can be over 100' and the No. 192-A will handle up to 5 tons per hour.

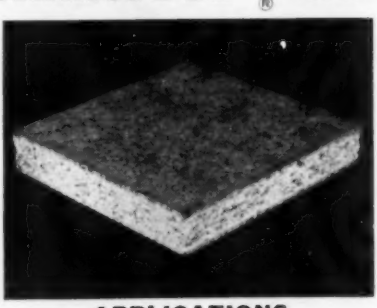
See Action Card, page 160. Circle No. 12

DELTA INTRODUCES 12" LATHE

Delta's new 12" gap bed cabinet model lathe for wood turning, and turning of light metals incorporates features affording maximum safety, durability and versatility. It offers infinite speed range between 340 and 3200 r.p.m., a capacity of 38" between centers, 12" swing over the bed and 16½" swing over the gap with stock up to 3½" thick.

The first lathe in its size range produced by Delta, it is designed to meet demands for a low-price, heavy-duty wood turning production tool that is

TRIMWOOD®—Now Available in 3 Ply Panel



APPLICATIONS

- Sliding Doors
- Cabinets
- Fixtures
- Sink Tops
- Table Tops
- Desks
- Furniture
- Displays
- Counters
- Paneling
- Shelving
- More Coming

ILLINOIS FIBRE SPECIALTY CO.

4800 So. Hoyne Ave. Chicago 9, Ill.

® Registered Trademark

TRIMWOOD 3 Ply is made of Hardwood Chips with two outer layers of smooth hardboard facings.

TRIMWOOD 3 Ply offers a smoother face and the best possible stability against warp and swelling.

TRIMWOOD 3 Ply is superior in screw holding strength, impact strength, tensile strength and appearance.

1. Ideal core for plastic laminates.
2. Perfect for veneer facings.
3. Offers excellent surface for painting.

SPECIFICATIONS:

Standard Panel Sizes - 48"x96", 30"x96", 36"x96".

Available Thicknesses - ¾", ⅞", 1" 1⅛", 1¼".

ORDER your sample now and find out how good TRIMWOOD could be for your product.

YOUR INQUIRY IS INVITED, but do it today.

Seymour, Indiana **Evansville, Ind.**

See Action Card, page 160. Circle No. 297

adaptable to other operations. In addition, there are more than 50 engineered accessories available, making this one of the most versatile of all lathes.

Principal features include:

—Enclosure of all movable parts where physically possible, thus providing additional safety.

—An easy-to-read, graduated speed indicator permitting quick setting to proper speed for each job, by means of a conveniently located hand wheel.

—Specially designed tail stock has quick-acting cam clamp for rapid positioning and secure locking to the bed. (Positive wrap-around clamp provides 360° clamping surface to firmly lock the tail stock ram. The ram is non-jamming, releases automatically and is graduated in 1/16" increments.)

—Indexing, variable-speed control and tail stock hand wheels specially engineered to fit contours of the hand, assuring easy, positive action and permitting minute adjustments necessary in fine work.

See Action Card, page 160. Circle No. 13

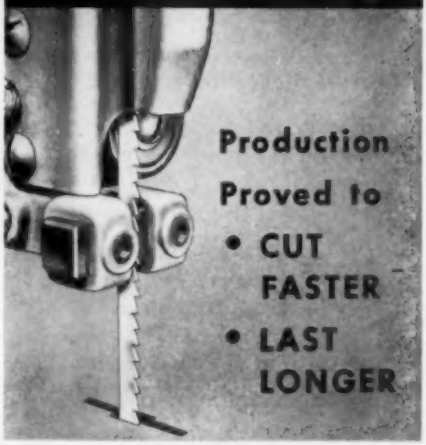
SPINDLE SANDER-GRINDER

A new, improved model oscillating spindle sander-grinder, utilizing abrasives on work spindles under ¾" diameter, has been announced by Boice-Crane Company, 931 Central Ave.,

Starrett

WOOD CUTTING

BAND SAW BLADES



REGULAR and SKIP TOOTH
In All Popular Widths

Whatever your preference, you can enjoy the fast-cutting, long-lasting economy of Starrett narrow wood cutting band saw blades.

Starrett Standard Wood Cutting Blades are uniformly hardened to provide a strong, rugged back with a keen, long-lasting cutting edge. They can be sharpened and reset again and again.

Starrett Skip Tooth Band Saw Blades with hard edge, flexible back and widely spaced teeth never need sharpening, outlast several ordinary blades. They eliminate sharpening bother and expense.

Buy the type you prefer through your Industrial Distributor. The L. S. Starrett Company, Athol, Massachusetts, U.S.A.

Since 1880 World's Largest Toolmakers

Starrett

MECHANICS' HAND MEASURING TOOLS AND PRECISION INSTRUMENTS • DIAL INDICATORS • STEEL TAPES • PRECISION GROUND FLAT STOCK • HACKSAWS • HOLE SAWS • BAND SAWS • BAND KNIVES

See Action Card, page 160. Circle No. 298

Toledo, Ohio. It is provided with spindles ¼", ⅜", ½" and ¾" in diameter.

With the new smaller diameters any kind of scroll-grill work or small radius contours can be machine finished. A second new feature speeds changing the arbors or drums carrying the abrasive sleeves. All arbors have taper-shanks which install instantly into a new taper-socket type main spindle.

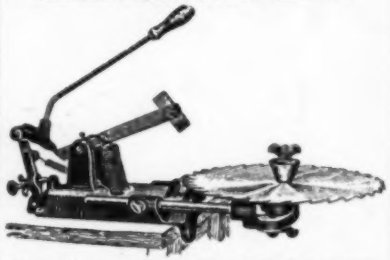
Still another advantage claimed is that the drums for abrasives over ¾" diameter may remain permanently on the new type spindles. The complete arbor, drum and abrasive assembly installs or interchanges with another size in a few seconds.

See Action Card, page 160. Circle No. 14

STAINLESS STEEL SWIVEL GLIDES

A new line of stainless steel swivel furniture glides has just been announced by Arrowhead Associates, Meriden, Connecticut. These new glides feature a shock and sound-absorbing polyethylene ball which acts as the swivelling mechanism. Stainless steel bases affording protection to flooring and carpets. Quick, positive application with new umbrella clip eliminating angle fitting or special adapters.

SIMPLEX
CIRCULAR SAW SETTING MACHINE



An excellent tool for setting small circular saws. The successful operation of all circular saws depends largely upon the manner in which they are fitted.

To obtain the best results the teeth should be properly and evenly set.

This machine does the work perfectly, insuring easy and true running and smooth cutting.

The hammer strikes every blow with equal force and at the same angle hence the set of each tooth is absolutely uniform. Will give a light, medium or heavy set.

Adjustable for saws, either rip or cut-off, from 5" to 24" in diameter.

The machine will last for years if handled with ordinary care and intelligence.

Further details upon request

ZEILLER & NAGEL, INC.
232 JAVA ST. BROOKLYN 22, N.Y.

See Action Card, page 160. Circle No. 299

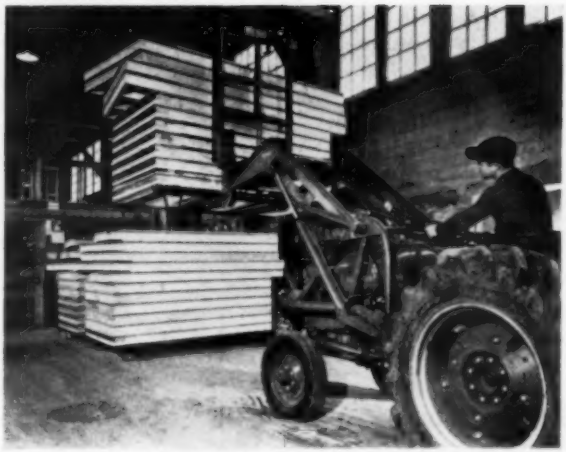
BURTON STEEL HEAD BAND SAWS
Burton Saw Co.
WORCESTER 8, MASS.

BAND RESAWS

"Filer Finished" — Ready to use!
Try 'em, you'll like 'em.
LOG BANDS NARROW BANDS

See Action Card, page 160. Circle No. 300

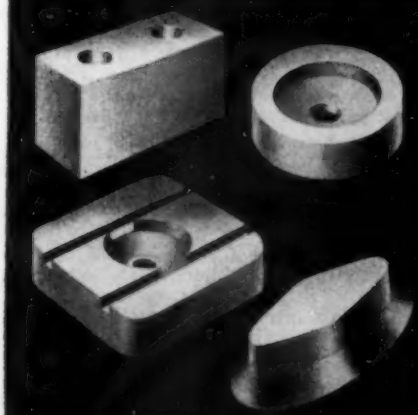
TRACTOR AT PREFAB PLANT



It's no job at all, and quick, too, for a single man at the Don T. Allen Co., Cudahy, Wis., to move a pile of prefabricated house partitions. He is using an International 300 utility tractor equipped with a fork-lift attachment on a front-end loader. This 42 h.p. commercial tractor can be equipped with torque amplifier, independent power take-off, fast-hitch, hydra-touch, and hydraulic power steering.

See Action Card, page 160. Circle No. 15

RUBBER PARTS
for WOODWORKING MACHINES



Made Tough . . .
Will Serve a Long Time

You can increase production by reducing shut-down time.

Equip your woodworking machinery with tough, white, moulded rubber cups and blocks; rubber tires for sander pulleys and band saw wheels and for glue spreader rollers.

Broadway rubber parts are made to fit all leading makes of woodworking machinery. They are tough and will last much longer than less durable parts.

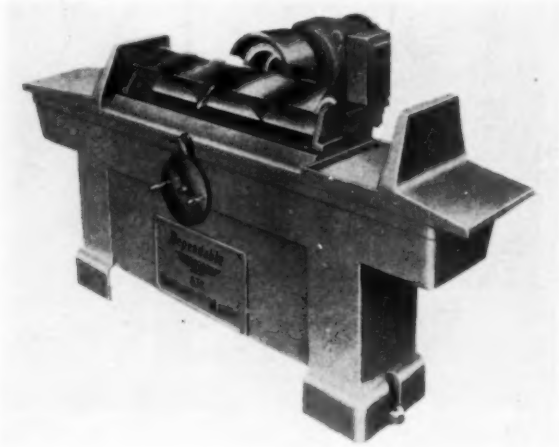
Write for free Wood Industry Bulletin.

WHITE RUBBER MALLETS

BROADWAY RUBBER CORP.
529 E. BROADWAY — LOUISVILLE 2, KY.

See Action Card, page 160. Circle No. 301

KNIFE GRINDER OFFERED BY DEPENDABLE



Dependable Machine Company, Greensboro, North Carolina, U.S.A., manufacturers of precision woodworking machinery, announce the development of a complete line of new low cost knife grinders. These machines are to be known as the Depend-O-Matics. Production has begun on the 32" and the 38" sizes. These machines will precision grind all straight edge cutters whether the knives or blades are of high speed steel, carbon steel or laid (tipped) high speed.

The Depend-O-Matic knife grinders have a new and unusual feature in that the V-ways and the drive mechanism runs in an oil bath. The gears are mounted in grease sealed housings and all bearings are pre-lubricated. Thus, these grinders do not require any lubrication.

These machines are equipped with automatic cross-feed and feeds the grinding head (not the knife bar). The grinding head unit is rigidly mounted. The automatic feed is controlled by ratchet and feed pawl and the rate of feed may be adjusted from .00025" to .0015". The grinders are direct motor driven with 2 H.P., ball bearing, fan cooled, continuous duty motor. They are available in either 3 phase or 1 phase.

See Action Card, page 160. Circle No. 16

NEW LACQUER

Rock Paint and Chemical Company, Fort Atkinson, Wisconsin has announced the development of a butyrate lacquer-type coating for interior wood applications. The new product is called Formula "66".

Formula "66" is extremely resistant to plasticizer migration from vinyl film or hard rubber, which is important in today's living with vinyl drapes, chair covers, etc., says the manufacturer.

This lacquer has good washability and water spot resistance combined with a mar and grease resistance that makes it a coating for kitchen or bathroom cabinets, doors, floors, woodwork, trim and other interior applications.

Formula "66" may be applied by airless spray, hot or cold spray or by brush. Its high solid, low viscosity provides covering in one coat where two are normally required and still maintains a toughness, adhesion and mar resistance of above average.

See Action Card, page 160. Circle No. 17

HOE CUTTING TOOLS

Here is the cutting tool exhibit which was set up by the Saw Division of R. Hoe & Co., Inc. at the N.A.F.M. Convention. On the left panel is a display of carbide tipped saws and the Kwik-Kut line of carbide tools. The table in front of this panel holds two helical cutters and a solid carbide knife.

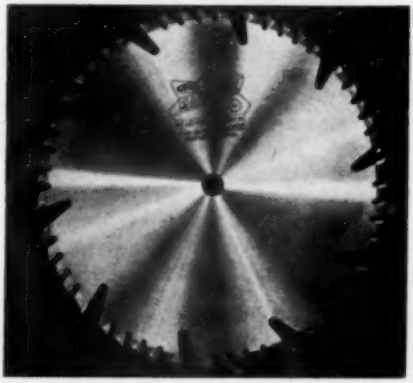
At the right is a variety of files, chisel tooth saws, grinding wheels, band saws and knives. Also shown are the steps required in manufacturing shanks and bits.

Literature explaining how wood cutting tools are made and how they should be maintained in service is available from R. Hoe & Co., Inc., Carbide Saw & Tool Div., Dept. S3-86, 1809 English St., High Point, N.C.

See Action Card, page 160. Circle No. 18

PLANER TYPE SAW

A new combination planer type saw has been added by the W. F. Meyers Company, Bedford, Indiana, to their new Mainline carbide tipped saw line.



Available in 10", 12", 14" and 16" diameters, this new saw is designed to rip, cutoff and miter with equal ability, producing smooth finished cuts in hard or soft woods, in veneer faced plywood, or in composition materials. The blade may be used on radial arm table saws and tenoner machines.

See Action Card, page 160. Circle No. 19

COLORED HARDBOARD

Progress in wood chemistry continues as Forest Fiber Products Co., Forest Grove, Oregon, introduces light-colored prefinished tempered hardboard. Named Sandalwood, the light color is baked into the board to give a sealed washable surface. In addition to the normal properties of tempered hardboard, Sandalwood has added durability, weather and scuff resistance.

See Action Card, page 160. Circle No. 20

RIGHT OR WRONG

A roundup of day to day in-plant problems and how they were handled by management men. Each incident is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to WOOD WORKING DIGEST.

Is discharge too severe a penalty for sleeping on the job?

What Happened

Louis Hosler did not deny that he was sleeping. He was found in that condition by the plant manager who had to shake him vigorously to get Louis to wake up. When he was fired, Hosler put up a wide-awake defense:

- No one in the company had ever been fired for sleeping.
- A man should be given "gradual discipline"—not discharged right off.
- Nothing serious happened while he was asleep.

These arguments didn't catch the company dozing. It said:

- Hosler was an engineer, and he had to stay awake to check on the pressure of boilers. If he didn't do his job well, lives and property could be jeopardized.
- In a job like Hosler's, sleeping is so serious that he should not be given a second chance.

Was the company: Right ☐ Wrong ☐

What Arbitrator Paul L. Styles Ruled

A worker might be given a second chance if, while he slept, none of his assigned duties were neglected. While Hosler slept, his duties, which consisted largely of being awake, were neglected. Just as a bar tender must be a sober man, and a judge an honest one, an engineer and watchman must be a wide-awake man. Discharge sustained."

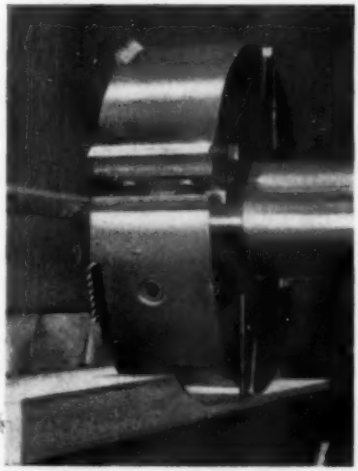
10 Operations - 5 to 10 Times Faster

AT LANE COMPANY

With VMT Tenon Machine Heads

Here's real production speed-up and labor savings. Specially designed VMT Tenon Machine Heads on Double End Tenoner at Lane Company does as many as 10 operations formerly done on Shaper for their chests and tables . . . all at 5 to 10 times faster depending on the width of the stock.

J. E. Bell, Machine Room Foreman at Lane, says "These heads have been in service three years now. There's no question but what they perform jobs 5 to 10 times faster. One of the chief advantages is that they cut cross grain on stock without splintering either on the face or opposite side."



VMT Tenon Machine Head with Spur Cutters with 6" cutting circle. This cutter is doing a climb cut. The stock and the cutters are going in the same direction. Note the Spur Cutters on the sides of the Head which give a clean cut on the shoulders. Heads can be used on single or double end Tenoner.

Write, Phone or Wire us today on how VMT Tenon Machine Heads can do a better job faster and cheaper for you.

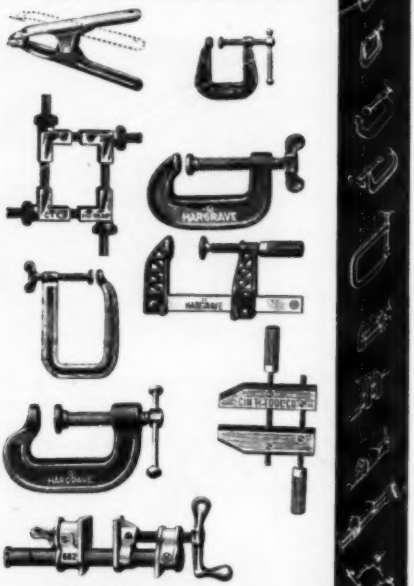
Virginia MACHINE TOOL CO.

BASSETT, VIRGINIA

Precision Made Tools For The Woodworking Industry—Standard or Milled To Pattern

See Action Card, page 160. Circle No. 302

HARGRAVE
THE MOST COMPLETE LINE
CLAMPS
Individually Power-Tested for Better Performance



There is A Distributor Stock Near You
FREE CATALOG
Shows a complete line of Clamps for all purposes, openings from ¾" to 12" and depths from ½" to 16". Chisels, Punches, Masonry Drills for hand and power hammers, Carbide Rotary Drills, Gasket Cutters, File Cleaners, etc.

THE CINCINNATI TOOL CO.
1949 Waverly Ave. Cincinnati 12, Ohio

HARGRAVE
The Complete Line of Tested
TOOLS

See Action Card, page 160. Circle No. 303

Can you fire an employee for being "Accident prone" if all his injuries are "very minor"?

What Happened

The company was a real stickler for safety. It carried on a continuous campaign via bulletin boards, meetings, and employee letters to get workers to develop safe working habits. One of the company's most stringent rules was that an employee must report every injury no matter how slight.

Bill Sandes was a packer. In this job he had to handle a lot of cartons and twine. Within a 15-month period he cut or bruised his fingers some 15 times. Each time he reported for first aid to the nurse as required by company rules.

When this record came to the attention of management he was discharged for "accident proneness." Bill grieved, and the case came to arbitration. He argued:

- These were all minor injuries.
- Reporting these injuries was a company rule. In other companies such trivial mishaps would not even come to management's attention.

The company's position:

- There is no clear, precise line of demarcation between a safe and unsafe employee. The decision,

therefore, must rest upon management.

- By having so many injuries, even though slight, this employee indicated he was incapable of performing his job satisfactorily.
- The job itself can't be blamed because other employees didn't have to go to first aid anywhere near as often as Sandes.
- An accident prone employee might really hurt himself seriously, so we are taking a preventive step.

Was the company: Right ☐ Wrong ☐

What Arbitrator Carroll R. Daugherty Ruled

"The company, by its right to set job standards, also has a right to determine whether a worker is capable of physically performing a job. It is also within the bounds of managerial discretion to set up a line of demarcation between a safe and unsafe employee, provided it exercises its authority in a non-discriminatory fashion. The arbitrator cannot prohibit or modify the right of a company to discharge an employee if the management has determined the employee to be unsafe, i.e., prone to accidents endangering his own welfare and/or that of other employees. Grievance denied."

Can you assign a woman to a man's job and pay her less?

Only WARDWELL Y18

Sharpens, bevels each tooth as it comes along

ONLY Y 18 HAS THE AUTOMATIC SWIVEL

Sharpens both cross cut and rip saws. Increases production — increases your profits.

No other saw sharpener has the automatic swivel, which saves one operation by eliminating second set up.

All bevels are perfectly uniform and all points balanced with saw in perfect cutting circle.

Please write for Y18 Bulletin.

AC 38 CIRCULAR SAW SETTER

Sets teeth at a speed of 150 to 200 per minute on saws with diameters from 5" to 38".

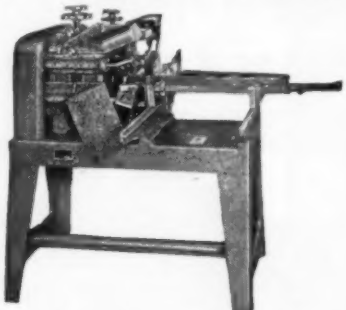
WARDWELL MANUFACTURING CO.

3806 Ridge Rd. Cleveland 9, O.

See Action Card, page 160. Circle No. 304

HARRIS

DELUXE FLOOR MODEL TENONER



New adjustment allows exact and simultaneous adjustment of tenon spindles.
3 H.P. Motor.
3 Inch Blades
V Belt pulley drive on both tenon and cope spindles.
Heavier Construction for greater accuracy

MILLBURY MACHINE COMPANY
13 WATERS STREET, MILLBURY, MASS.

See Action Card, page 160. Circle No. 305

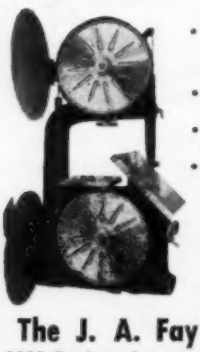
FAY & EGAN

High Speed

BAND SAWING

Smoother cuts assured . . .
Less follow-up needed . . .

PRODUCTION VASTLY INCREASED!



- Carter Demountable Wheels
- Fully Safety Guarded
- Trouble-Free Service
- METAL CUTTING MODELS AVAILABLE

WRITE FOR FULL DETAILS

The J. A. Fay & Egan Co.
2023 Eastern Avenue Cincinnati 2, Ohio

See Action Card, page 160. Circle No. 306

What Happened

For many years the work in a particular department was performed by men. It was mostly machine operated. When more machines were added, the company decided to transfer some women from another department to operate these units. The women were paid their old rate which was 15c an hour below what men were getting on these same machines. Production was about the same. The women protested their lower rate on the grounds of equal pay for equal work. The company stood its ground. It held that:

1. There is nothing in our agreement that requires us to pay equal rates to women for the same jobs.
2. We have a right to transfer employees to other jobs.
3. We have no iron-clad job rates. Some pay more—some pay less. Our operations are such that we must transfer employees freely from one operation to another. There is nothing in our practice that says we must change their rates with every transfer we make.

Was the company: Right ☐ Wrong ☐

What A Board Of Arbitration Ruled

"In the contract between the company and the union, there is no clause

TANNEWITZ AUTOMATIC GAUGE
for Swing Saws
SAVES $30 to $50 A MONTH IN LUMBER AND LABOR
30 Days Free Trial
ORDER NOW OR SEND FOR CIRCULAR
TANNEWITZ WORKS

See Action Card, page 160. Circle No. 307

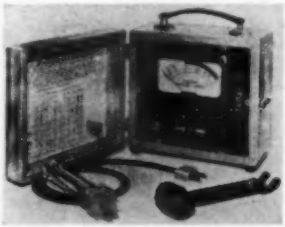
YOU NEED AN M.D.*

. . . to determine whether your lumber is dried to the right moisture content.

. . . if you encounter warpage or end checking during production.

. . . if your customers are complaining of shrinkage or swelling.

. . . to learn whether you are paying freight on excess moisture.



***Delmhorst Moisture Detector**

A Delmhorst Moisture Detector makes it easy for you to know the moisture content of any wood in a matter of seconds without involved calculations. Yet, the instrument is so low priced it pays for itself in a short time!

MAIL THE COUPON BELOW TO DELMHORST INSTRUMENT CO. FOR FREE INFORMATION ON USING LUMBER AT THE RIGHT MOISTURE CONTENT. NO OBLIGATION—OF COURSE.

DELMHORST INSTRUMENT CO., 607 CEDAR ST., BOONTON, N.J.

Please send information to:

Mr. _____

Title: _____

(Attach to your letterhead)

See Action Card, page 160. Circle No. 308

which limits management's right to assign the work in question. In the absence of such specific contract provision which imposes such restriction, the basic principle controls that a company has an inherent, an absolute, an exclusive right to operate its business and plants and direct the work of its employees in any manner not prohibited by law, or by collective bargaining agreement, or contrary to the rights of its employees.

"The union cannot by means of arbitration and the use of the grievance machinery arrive at a net result of a higher rate for performing a specific operation than was actually negotiated between the parties. Arbitration cannot extend or enlarge the agreement. The grievance is denied."

NEW POWER BRAKE FOR RADIAL ARM MACHINES

A dynamic power brake which helps eliminate "drift" time of the cutting tool after the electrical current is shut off has been perfected by DeWalt Inc., a subsidiary of American Machine & Foundry Company, for use on all models of the company's radial arm type woodworking machinery. The new dynamic power brake can be installed on DeWalt machines now in the hands of users or can be specified as optional equipment on new purchases. The brake units are supplied as self-contained packages, easy to install on the job with a minimum of down-time for conversion.

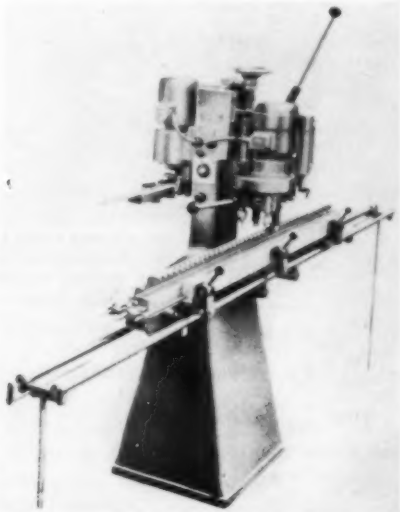
Impartial safety surveys have indicated that many on-the-job accidents occur after power equipment has been turned "off", but while the moving parts of the machinery are still coasting to a stop. Without adequate braking equipment, this drift time may involve several minutes of potential danger to the operator. Coasting time can be reduced from a maximum of 435 seconds to about 25 seconds on a 16" saw blade, producing a safety factor for the brake of 1640%.

Mechanically, the DeWalt dynamic power brake incorporates a magnetic or manual motor starting mechanism in addition to the electrical components controlling the braking action itself. Thus, the one unit serves both as motor starter and power brake, eliminating the necessity of individual provision for these two separate functions.

See Action Card, page 160. Circle No. 21

SHUTTER GROOVER

This shutter-grooving machine can make both right and left shutter stiles at the same time. Known as the Supreme semi-automatic shutter groover, this machine enables even an unskilled operator to produce matched stiles and achieve a high level of production. As a result, shutter assembly is simplified



since rejects and poor matches are virtually eliminated. Groove length, spacing and depth can be adjusted quickly and a shaping attachment is available that can round off two edges of shutter lath at one time. In addition, this machine can handle stiles up to 7'1" or even longer.

Illustrated literature and complete details are obtainable from Supreme Woodworking Machinery Corp., 50-52S Howard St., New York 13, N.Y.

See Action Card, page 160. Circle No. 22

INDUSTRY NOTES

"DESIGN IN HARDWOODS" AWARDS DEADLINE SET

Every type of hardwood product, architectural installation and art creation is eligible for an award in the Third "Design in Hardwoods" Awards Selection sponsored by the Hardwoods Exhibit, Inc., a non-profit educational board representing all branches of the hardwoods industry in the management of the Hardwoods Exhibit at Chicago's world-famous Museum of Science and Industry. Deadline for entries in the various design categories has been set for November 5, 1956.

Winning designs and designers will be announced November 15 at an Awards Banquet held during the Fine Hardwoods Association's annual meeting in Chicago.

Six awards for Highest Honors and 30 Honorable Mention scrolls will be presented to products selected under four major design classifications: Production Furniture, Architectural Installations, Custom Furniture, and Miscellaneous, which includes all hardwood products and arts and crafts objects not specifically covered under the other categories.

Additional information is available from the Fine Hardwoods Association, 666 Lake Shore Drive, Chicago, Ill.

A.W.I. CONVENTION

The 4th Annual Convention of the Architectural Woodwork Institute will convene at the LaSalle Hotel, Chicago, October 18-19, 1956. The Convention will be preceded by a President's reception for Institute members and the press on the evening of Wednesday, October 17th.

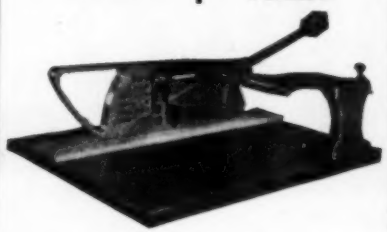
The Architectural Woodwork Institute has in three years, developed into a well-recognized and potent force in the wood industry. With an active membership in almost every area of the United States and Canada, the Institute is conducting an intensive campaign to interest and educate the architectural profession in the uses and advantages of wood for construction purposes. This is being accomplished by sending them regularly a series of attractive and authoritative brochures—each of which covers a specific subject, e.g. paneling, doors, windows, cabinets, etc. This effort is backed up by the personal calls and services of the Institute's members.

CLARK EQUIPMENT COMPANY MOVES SERVICE SCHOOL

Clark Equipment Company has moved its Service School, formerly located in Jackson, Mich., to completely new quarters at Battle Creek.

Located in the recently established Materials Handling Development Center, the new facilities include two lecture rooms, modern maintenance equipment and new projection and sound equipment. A unique lighting system permits dramatic lighting effects for illustration of lectures.

FLOHR | **AUTOMATIC SAW GUARDS**

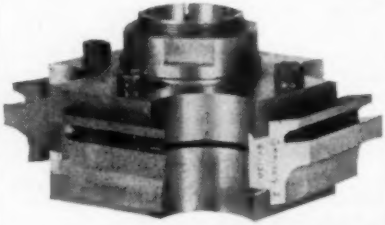


Built of steel and malleable iron, will withstand any strain. Equipped with famous "Flohr Non-Kick-Back Fingers," they make fatal accidents impossible. Made in sizes to fit the smallest saw and up to 36 inch diameter.

D & M GUARD COMPANY
897 Military Road Buffalo 17, N.Y.

See Action Card, page 160. Circle No. 309

CUTTERS WITH A PURPOSE



Every cutterhead and knife that leaves our plant is designed, manufactured and guaranteed to do a particular work in the most economical and efficient manner.

Write us.

GRAYCON TOOLS, INC.
WABASH, INDIANA

See Action Card, page 160. Circle No. 310

OFFICERS ELECTED FOR HARDWOODS EXHIBIT BOARD

The hardwood industry's star salesman, the $350,000 Hardwoods Exhibit at Chicago's Museum of Science and Industry, continues to impress visitors by the millions. Behind the scenes, keeping this exhibit functioning, is a hardworking core of industry leaders.

Alvin Huss, Huss Lumber Co., Chicago has been elected president of this supervisory board, the Hardwoods Exhibit, Inc., at a recent meeting held at the American Furniture Mart, Chicago.

Other newly elected officers are, vice-president, J. P. Hamer, J. P. Hamer Lumber Co., Kenova, West Virginia; secretary, Franklin T. Griffin, Franklin T. Griffin Co., Chicago; Treasurer, George F. Wilhelm, R.S. Bacon Veneer Co., Chicago.

The new board of directors, composed of the presidents of the industry associations supporting the Hardwoods Exhibit include: R. E. Hollowell, Jr., American Walnut Mfrs. Assn.; Norman Warner, Appalachian Hardwood Mfrs. Assn.; Russell Lee, The Birch Club; Wm. F. Ashby, Fine Hardwoods Assn.; George Rozzell, Hardwood Dimension Mfrs. Assn.; C. U. Gramelspacher, Hardwood Plywood Institute; Robert P. Thompson, Mahogany Assn.; Donald S. Dewitt, Maple Flooring Mfrs. Assn.; T. M. Millett, National Hardwood Lumber Assn.; J. G. Smith, National Oak Flooring Mfrs. Assn.; Walter J. O'Brien, National Wholesale Lbr. Dist. Yds.; Abbot Fox, Northern Hemlock & Hardwood Mfrs. Assn.; Henry W. Jones, Southern Hardwood Producers, Inc.; Raphael Blessinger, Wood Office Furniture Institute.

The Hardwoods Exhibit that these men supervise on behalf of the entire industry is one of the show pieces of the world-famous museum in Chicago.

FORESTRY CONFERENCE

More than 1,200 persons are expected to attend the 56th annual meeting of the Society of American Foresters, scheduled to convene in the Peabody Hotel, Memphis, Tenn., Oct. 14-17.

IMPORTANT FPRS DATES

Oct. 16, 1956: Upper Mississippi Valley Section Meeting, Wausau, Wisconsin.

Fall 1956: Carolinas-Chesapeake Section Annual Meeting, Pinehurst, N.C.

Oct. 24-25, 1956: Midwest Section Meeting, Rockford, Illinois

Oct. 25-26, 1956: Northeast Section Meeting, New York City.

Oct. 29-30-31, 1956: Mid-South Section Annual Meeting, Laurel, Mississippi.

Nov. 8-9, 1956: Great Lakes Section, Grand Rapids, Michigan.

Dec. 7-8, 1956: Florida-Georgia-Alabama Section, Annual Meeting, Athens, Georgia.

DRY KILN COURSE

A five-and-a-half day course in kiln operation will be given at the University of California Forest Products Laboratory, Berkeley, Calif., December 10-15.

The course will make use of the laboratory's newly-completed dry kiln and will consist of lectures and demonstrations on dry kiln mechanics, kiln operation, quality control in drying, wood moisture relations and dry kiln schedules.

Cooperating with the Laboratory will be the California Forest and Range Experiment Station of the U. S. Forest Service, and the U. S. Forest Products Laboratory, Madison, Wis.

Inquiries concerning the course should be sent to University Extension, University of California, Berkeley 4, California.

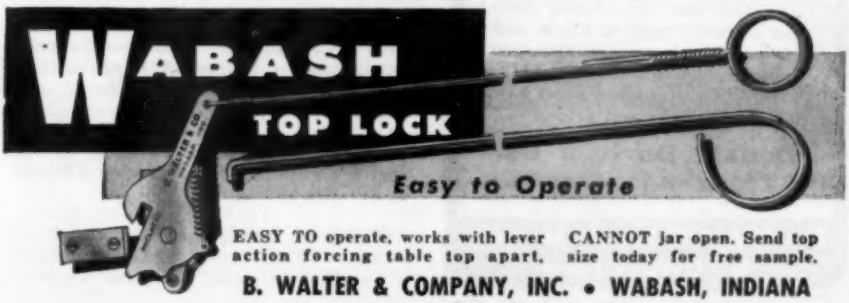
FORESTRY SCHOLARSHIPS

Gair Woodlands Corp. of Savannah, Ga., has awarded its two annual $2000 scholarships in forestry to William E. Patterson of Metter, Ga., and William R. Truluck of Suwannee County, Fla. The scholarships, cover a four-year period.

Purpose of awards is to encourage the study of forestry on the part of high school seniors. Both winners plan to attend the University of Georgia, Athens, Ga.

UP PRODUCTION—
Cut Costs!
PLANER KNIVES
MOULDER KNIVES
SHAPER STEEL
JOINTER KNIVES
WITH
Supreme
KNIVES
You step up your production with Supreme Knives... milled to exact specifications... to insure a perfect fit in the machine. Made from the correct alloy steel for your particular job, Supreme Knives work harder... longer. The expense of early re-sharpening and replacing is eliminated.
We design and make Special Knives to your requirements.
WRITE TODAY FOR YOUR COPY OF THE SUPREME CATALOG NO. E
SCRIBER KNIVES
SHEAR KNIVES
CIRCULAR KNIVES
THE SAW & KNIFE SPECIALTY CO., INC.
4324 CARNEGIE AVENUE • CLEVELAND 3, OHIO
SEND US YOUR CARBIDE-TIPPED KNIVES CUTTERS ROUTER BITS
We will promptly repair, retip and sharpen your Carbide-Tipped tools and get them back to you without delay. Skilled workmen and precision equipment insure fast service and complete satisfaction in restoring cutting efficiency.
PROMPT DEPENDABLE SERVICE

See Action Card, page 160. Circle No. 311



EASY TO operate, works with lever action forcing table top apart. CANNOT jar open. Send top size today for free sample.

B. WALTER & COMPANY, INC. • WABASH, INDIANA

See Action Card, page 160. Circle No. 312

FREE Sample

Send request on your letterhead for liberal sample free. No obligation.

WOOD WORKERS SAY: "Durham's Rock-Hard Water Putty covers up Nature's mistakes as well as our own. It handles beautifully — finishes smooth as velvet."

Durham's Water Putty has great strength and adhesion. This modern plastic fills knotholes or cracks, replaces chips, fills and smooths off edges of plywood, etc. *Absolutely does not shrink.* Comes in 25, 50 and 100-pound drums in powder form—keeps indefinitely. Mix with water as needed. Send now for free sample and prices.

Donald Durham Co.
Box 804-K Des Moines 4, Iowa

The PLASTIC Repair Material in POWDER Form

See Action Card, page 160. Circle No. 313

Appointments

George C. Romeiser has been appointed secretary-manager of the American Walnut Manufacturers' Association, Chicago. Mr. Romeiser succeeds **Charles H. White,** who has assumed the position of sales manager of the Wolverine Finishes Corporation of Grand Rapids, Michigan. Wolverine has recently acquired a plant in Louisville, Ky., and has a new plant under construction at Morganton, North Carolina.

Manager of the Project Engineering Department for Acme Steel Co., Chicago, is **Hugh D. Connell.** Connell has been with the firm since 1947 as a sales engineer and later a project engineer.

James E. Good, Arlington Heights, Ill., is now field sales manager of the Atkins Saw Division, Borg-Warner Corp., Indianapolis. He will supervise the field sales force as well as carry out an extensive program of sales promotion and distributor contact work.

Breuer Electric Mfg. Co., Chicago, has appointed **Robert L. Kline** as the company's new general sales manager. He will supervise all sales.

Schuyler C. Reber is now vice-president in charge of sales for Deluxe Saw & Tool Co., Louisville, Ky. He has had experience in field distribution and in private manufacturing.

Armour and Company, Coated Abrasives Div., Alliance, Ohio, announces the appointment of **William A. Hipps** as sales supervisor in Tennessee, North and South Carolina and Georgia.

The Henry Disston Division, H. K. Porter Company, Inc., has named **Birnie V. Edridge** as controller.

George M. Hartley has been appointed manager of marketing for General Electric's Metallurgical Products Depart-

ment, Detroit. This firm has named **A. F. Dobbrodt,** a 27-year veteran of carbide applications, as Pacific Northwest sales representative. He will headquarter in Seattle.

James A. Ryan has joined the legal staff of the National Lumber Manufacturers Association as an assistant counsel.

Rockwell Manufacturing Company's president, **Willard F. Rockwell, Jr.,** has been selected as co-chairman of a special 14-member committee appointed by Pennsylvania Governor George M. Leader to work on solutions for state financial problems.

Byron E. Coon, former manager of sales promotion and merchandising for the Rockwell Mfg. Co., Delta Power Tool Div., has been named general sales manager. **Irving G. Meyer** has been named sales manager and product manager of Delta Homecraft.

Western Pine Association has selected **A. J. Wantroba** as field representative for Ohio, Michigan and Northern Ind.

ROBERT ELLIOTT

Robert C. Elliott, former president of Standard Dry Kiln Company, Indianapolis, Ind., passed away September 1, 1956 after an illness of over two years. Mr. Elliott was president of Standard Dry Kiln Company until February of 1954, with more than 35 years of company service. His father, Robert Elliott started the Standard Dry Kiln Company in 1887, in Louisville, Ky., and the company was later moved to Indianapolis, Ind., where it is now located.

Mr. Elliott was well known throughout the woodworking industry for many years and made his home in Indianapolis until 1944, when he and Mrs. Elliott moved to Fort Lauderdale, Florida. Mr. Elliott is survived by his wife, four children and nine grandchildren.

How to get 25% to 40% FASTER CUTTING with your Power Saws

The machine accuracy of the Foley Saw Filer cannot be equalled by the most expert hand filing. The Foley automatically joints the saw as it files, bringing all uneven teeth back to uniform size and perfect spacing. Instantly production goes up 25% to 40% because your saws cut faster, smoother, run cooler — and stay sharp longer too!

FREE BOOK

on Modern Saw Maintenance

This is the instruction book which goes with every Foley Saw Filer. It will show you how the Foley eliminates all inaccuracies, how simple and positive its adjustments are. If you are conditioning saws by hand, this book points the way to both increased production and reduced saw maintenance costs.

FOLEY *Automatic* **SAW FILER**

FOLEY MFG. CO.

3351 Foley Bldg., Minneapolis 18, Minn.
Without obligation, send me the Foley Saw Filer Instruction Book.

Name .....

Address .....

See Action Card, page 160. Circle No. 314

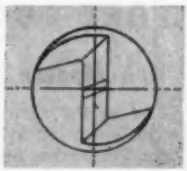
FOREST CITY

"400" High-Speed Router Bits

INCREASE PRODUCTION AND TOOL LIFE*

*It's the high clearance angle edge that counts...

This end-view drawing tells how Forest City High-Speed Router bits are designed to prevent dragging and overheating.



Assure maximum production with lowest tool cost—done only with Forest City Router Bits. You will be pleased with the continual, clean, true cuts.

Available through machinery distributors

A post card to us will bring you latest catalog and prices.

FOREST CITY BIT & TOOL CO.
1210-M KISHWAUKEE STREET · ROCKFORD, ILL.

See Action Card, page 160. Circle No. 315

AVAILABLE LITERATURE

Dewalt Machines. This 20-page booklet gives detailed descriptions of the various mechanical movements of the radial arm type machine; advantages in tools of this design; more than 100 actual operation photographs showing the applications of the basic machine and its various accessories. Built in safety features and provisions for accurate alignment and adjustments are included and a detailed listing of available tools and attachments, many of which have been recently added to the line and are presented for the first time in this booklet.

DeWalt Inc., Lancaster, Pennsylvania.
See Action Card, page 160. Circle No. 23

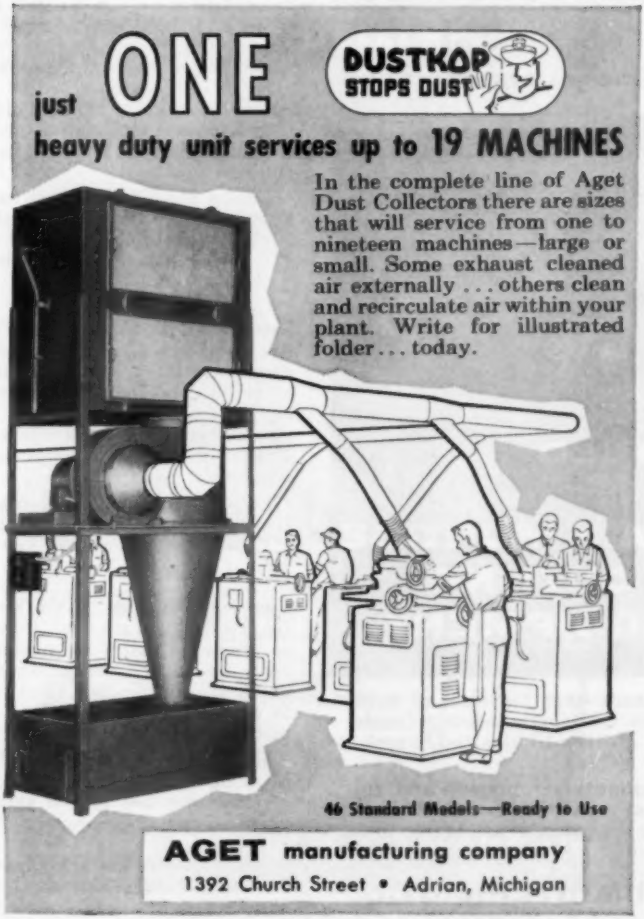
Teco Trussed Rafters. A combination of 2x4's and 2x6's with 2½" Teco wedge fit split rings comprise the Teco trussed rafter. The folder includes a savings chart with a comparison between two roof framing methods and shows the amount of lumber required for each component.

Timber Engineering Company, 1319-18th Street, N. W., Washington 6, D.C.
See Action Card, page 160. Circle No. 24

Locksets and Accessories. A colorful 8-page catalog gives technical information regarding all locksets and trim fixtures, as well as descriptions of installation aids. Write for the "400" line catalog which describes the locksets and accessories in both the new Bel Air and standard designs.

Kwikset Sales and Service Company, Anaheim, California.
See Action Card, page 160. Circle No. 25

Grade-Marking. The ninth of a series of architect's bulletins offers grade-marking as a solution to many problems attendant to proper lumber specifications. This bulletin gives architect's specification data demonstrating how


just ONE
DUSTKOP STOPS DUST
heavy duty unit services up to 19 MACHINES
In the complete line of Aget Dust Collectors there are sizes that will service from one to nineteen machines—large or small. Some exhaust cleaned air externally . . . others clean and recirculate air within your plant. Write for illustrated folder . . . today.
46 Standard Models—Ready to Use
AGET manufacturing company
1392 Church Street • Adrian, Michigan

See Action Card, page 160. Circle No. 316

grade-marking simplifies that function as well as providing assurance that quality standards have been met.

Southern Pine Association, P.O. Box 1170, New Orleans 4, Louisiana.

See Action Card, page 160. Circle No. 26

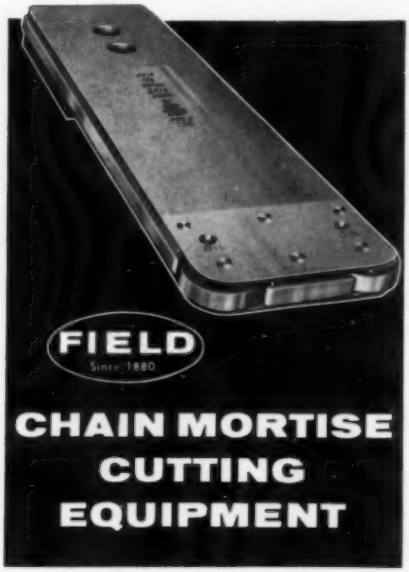
How Research Dollars Are Put To Work. A behind-the-scenes view of how an industrial research program is initiated and conducted, and the prerequisites for its successful conclusion, are featured in the 25th issue of "Wood Research." The author stresses the practical aspects of applied research, and the business basis on which it is conducted for the lumber and wood product industries.

Copies of Wood Research No. 25 are available from Timber Engineering Company, 1319-18th Street, N. W., Washington 6, D.C.

See Action Card, page 160. Circle No. 27

Teco Pocket Catalog. Illustrations and

For Blind or Extremely Long Mortises



We stock over 150 sizes of both double and single-bearing Guide Bars, Mortise Chains and Sprockets.

Our quality equipment and interchangeable replacement parts insure maximum mortising production for your plant.

William H. Field Co.
INCORPORATED
332 DORCHESTER AVENUE
BOSTON 27, MASS.

Whatever you do, get the facts about

FIELD
Since 1880

See Action Card, page 160. Circle No. 317

basic data are given on split rings, used in clear-span trussed rafter construction, and on anchors that provide tighter nailed joints in wood framing. They are used in roof framing, to tie rafters securely to plates; in floor framing; as joist hangers, eliminating notching and shimming; in wall framing, for increased rigidity.

Copies may be obtained from Timber Engineering Company, 1319-18th Street N. W., Washington 6, D.C.

See Action Card, page 160. Circle No. 28

Selecting Lumber. Circular D70, discusses how grain, defects and moisture content affect the quality and strength of wood. The minimum grade of lumber recommended for each purpose is given together with the relative desirability of the various species of wood commonly used.

Order from Small Homes Council, University of Illinois, Urbana, Illinois.

See Action Card, page 160. Circle No. 29

Common Fallacies About Wood. Report No. 1167, clears up such misconceptions as the belief that wood naturally decays with age, that wood construction is more susceptible than steel construction to damage by fire, or that it becomes brittle at low temperatures.

U. S. Forest Products Laboratory, Madison 5, Wisconsin.

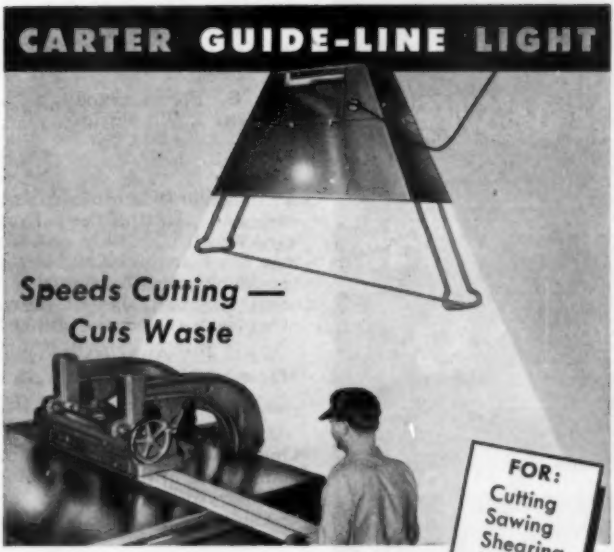
See Action Card, page 160. Circle No. 30

Color Test for Early Storage Decay in Southern Pine. This report describes a simple test that will enable the user to detect infection by the common decay fungus Peniophora gigantea.

Write for report No. 2037 from U. S. Forest Products Laboratory, Madison 5, Wisconsin.

See Action Card, page 160. Circle No. 31

News and Views of This Kiln Drying Business. A description of a simple steel guard that will protect the bottom courses of lumber when kiln charges are loaded and unloaded by power winch and cable is presented in report



Save time and materials in cutting, sawing or similar operations. Specially focused light casts straight, hair-line shadow in perfect alignment with projected path of cut. Also available with baffle plate to cast white line for cutting dark materials. Prevents needless waste and speeds production — is particularly popular in any ripsaw operation. Costs only pennies per hour.

Write Dept. 423.

CARTER PRODUCTS COMPANY, Inc.
30 Ionia Ave. Grand Rapids, Michigan

See Action Card, page 160. Circle No. 318

No. 1769-18. This report describes a concrete bumper for forklift trucks that provides traction for the truck and a flat surface for pushing kiln loads, boxcars, etc.

U. S. Forest Products Laboratory, Madison 5, Wisconsin.

See Action Card, page 160. Circle No. 32

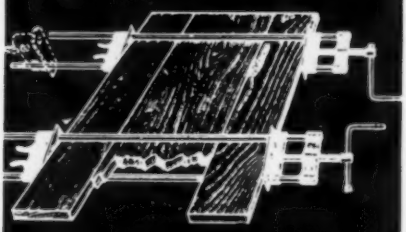
U. S. Plywood Literature. Three booklets dealing with Weldwood products. One is a presentation of the Weldwood Stay-Strate door and another deals with the Weldwood fire door. The third discusses Weldwood Perfowood a decorative perforated panel.

United States Plywood Corporation, Weldwood Building, 55 West 44th Street, New York 36, New York.

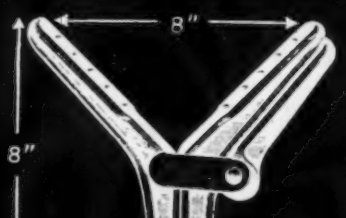
See Action Card, page 160. Circle No. 33

Resin-Treated Wood (Impreg). A description of the impregnation of wood with chemicals to reduce swelling and

HARTFORD
has the ANSWER—



No. 3 DOUBLE BAR CLAMP
Quick adjusting, self-locking and unlocking. Built to stand greater strain.



MITRE CLAMP
Planed jaws with hardened steel pins. Eccentric lever draws work up square and firm.

THE HARTFORD CLAMP CO.
EAST HARTFORD, CONN.

See Action Card, page 160. Circle No. 319

shrinking. Discusses the properties of impreg, and suggests applications, such as use for patterns and die models. Write for report No. 1380.

U. S. Forest Products Laboratory, Madison 5, Wisconsin.

See Action Card, page 160. Circle No. 34

Auto-Nailer. The auto-nailer makes its own nails, cutting them from a coil of wire which is quickly and easily loaded into the machine. Nail length selection, toe-touch control, countersink adjustment and table height adjustment are other features of the auto-nailer.

Write the Auto-Nailer Company, 267 Marietta, N. W., Atlanta 13, Georgia.

See Action Card, page 160. Circle No. 35

Operation Profit. A 43 minute, 16 mm. sound motion picture in color. This fast moving, highly informative film tells the story of Mr. Smith, a lumber dealer with an unmechanized yard, who visits material handling demonstrations. Lumber trees, easy entry plates, and other equipment designed to conserve space and reduce costs are explained.

Hyster Company, 2902 N. E. Clackamas Street, Portland 8, Oregon.

See Action Card, page 160. Circle No. 36

Clarklift Line. Construction details, operating characteristics and maintenance features of the Clarklift line of fork trucks are described in a 16-page, 3-color brochure, titled "Clarklift Features." The two separate braking systems are illustrated and described, as are a number of safety and comfort features.

Clark Equipment Company, Industrial Truck Division, Battle Creek, Michigan.

See Action Card, page 160. Circle No. 37

Finger Jointed Stock. Jointed stock is made up of short lengths which result from the trimming out of knots and other blemishes not desirable in woodwork. Because of the shorter lengths of these individual pieces, warp is held to a minimum.

See Action Card, page 160. Circle No. 38

Request "Precision Finger Jointed Stock," Western Pine Association, 510 Yeon Building, Portland 4, Oregon.

See Action Card, page 160. Circle No. 39

Edge Gluing Press. Requiring one operator, the press handles 2,000 or more board feet per day. New folder describes Model A a high frequency electronic edge-gluing press which handles panels up to 4" thick in almost unlimited lengths.

Raybond Electronics, Inc., 66 Needham Street, Newton Highlands 61, Massachusetts.

See Action Card, page 160. Circle No. 40

Shaper Steel Heads & Knives. Bulletin No. 800 is printed in two colors, and is illustrated with actual installation pictures, together with cuts of various types of shaper heads, collars, and knives available; a complete list of both ball bearing and solid shaper collars and shaper steel showing the various sizes that are carried in stock, together with a complete dimension of recommended sizes.

Wisconsin Knife Works, Box 309, Beloit, Wisconsin.

See Action Card, page 160. Circle No. 41

Why Hot Spray? This booklet lists the major benefits of hot spray application of finishing materials and explains each benefit in detail. Case histories are cited to illustrate each benefit. In another section questions most frequently asked about hot spray are listed, with their detailed answers.

Spee-Flo Company, 720 Polk, Houston 2, Texas.

See Action Card, page 160. Circle No. 42

Electric Hand Saw. The 8-ball and roller bearings are fitted between movable parts in order to reduce friction and to increase the length of life of the Lesto saws. An attachment for assisting in the dovetailing of wood and also a roller guide to cut corrugated materials are very practical supplementary items.

Victor J. Krieg Inc., 611 Broadway, New York 12, New York.

See Action Card, page 160. Circle No. 43

CHECK THE 6 BIG ADVANTAGES

YOU GET WITH DISSTON PHILBRICK® CUTTER HEADS

1. No lost cutter life in holding device.
2. Equal cutter life in 4-6-8-10 or 12 knife heads.
3. Heads dynamically balanced.
4. No loading up and no chip marks on work.
5. No wear on heads from chips.
6. No holders, clamps or gibs.

Available in standard patterns or to your own special contours.

Henry DISSTON DIVISION
H. K. PORTER CO., INC.
1095 Tacony, Philadelphia 35, Pa.

HKP DISSTON

See Action Card, page 160. Circle No. 320

Mechanics Through The Ages

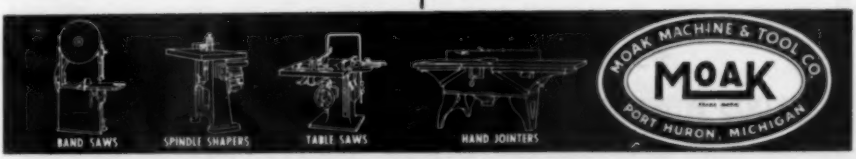
MANY OF THE ...
STEAMBOATS
OF EARLY 19TH CENTURY AMERICA WERE LUBRICATED AND ILLUMINATED BY OIL MADE FROM CHOICE PORTIONS OF THE CARCASSES OF HOGS! IN THOSE DAYS, MANY SLAUGHTER HOUSES PACKED FOR EATING PURPOSES ONLY THE HAMS AND SHOULDERS.
AL REETZ
AS EARLY AS 1500,
WORKERS OF NUREMBURG, GERMANY USED TOOLS PROVIDED WITH HOLLOW HANDLES INTO WHICH OTHER TOOLS COULD BE INSERTED.
The Pioneer Clock, BUILT IN 1326 BY RICHARD WALLINGFORD, ABBOTT OF ST. ALBANS, ENGLAND AND SON OF A BLACKSMITH, WAS STILL TELLING TIME DURING THE REIGN OF HENRY VIII ----
200 years later!

It's a fact:

The Moak High Speed Band Saw is the only band saw made on which the operator can make every adjustment without moving from his tracks.

For ALL The Facts

about the Moak High Speed Band Saw, write today for our illustrated booklet. MOAK MACHINE & TOOL CO., Port Huron, Mich.



See Action Card, page 160. Circle No. 321

WOOD WORKING DIGEST

Technical Series Booklets

These booklets should be in every technical library. Each, written by an expert in the field, is crammed with useful information important to every phase of the wood working industry. Send for your set today!

NO.		PRICE
101	Glossary of Adhesive Terms Twenty pages of adhesive terms used in the woodworking industry	25c
102	American Woods More than 80 different wood species are described. Recommended uses. 44 pages.	35c
103	Electronic Gluing A comprehensive 88 page survey of electronic gluing applications. Well illustrated.	$1.00
104	Types of Plywood Fourteen chapters, 84 pages, describing various types of plywood, how manufactured and recommended uses.	$1.00
105	Handy Reference Tables This could well be the most helpful 16 page booklet in any woodworking shop.	25c
106	Gluing Techniques for Woodworkers Crammed with information on current gluing techniques by the well known authority, Thomas D. Perry. 50 pages.	50c
107	Cutting Techniques for Woodworkers Another 50 page booklet by the same author, Thomas D. Perry. Describes fundamentals as to how various tools function in separating wood fibers.	50c
108	Furniture Finishing Fundamentals of wood furniture finishing from moisture control to methods of application for coatings. 96 pages.	$1.00
201	Practical Time Study An 80 page "How to do it" booklet written by Harold R. Nissley. Practical, down to earth and free of theoretical notions.	$1.00

Complete Set of the nine booklets listed above:

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Borer, W&M 283-B, bb dmd, single spindle
Borers: Root Single Spindle Direct Motor Drive
Carvers, Porter bb, dmd
Clamps, McKnight Chair, Air operated
Clamps, Billstrom 20 sec., 6 clamps sec.
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Dowel Machine, Bell bd. & motor
Glue Jointer, Yates No. 213 & Jenkins 343A, bb, dmd.
Glue Spreaders, 12" Black Bros. dmd.
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Jointers, New Moak 12" bb, dmd.
Jointers: 12"—8" & 16" bb, v-drive
Jointers, Porter 24" bb, dmd
Lathes, Yates No. 74 bb, dmd
Mortiser, New Britain No. 7 bd. & motor
Moulders, Yates-American C-89—6" bb, dmd
Planer, Whitney 30" Single bb, dmd
Planers, F&E—30" double, pb, bd & motors
Planers, Berlin 36" round head dmd
Planers: Buss No. 4—30 & 36" bb. dmd
Planers, New Crescent 24" bb, dmd
Facing Planers: 20" & 36" bb, dmd.
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Routers, Defiance single spindle high speed dmd
Sanders, W&M No. 294 stroke dmd
Sanders, Yates No. 431—42" endless bed, dmd.
Sander, G&S dbl. arbor Pneu. dmd.
Sander, Mattison No. 124 stroke
Sanders, Niagara brush, bb, dmd
Sander, 48" double disc, dmd
Sanders, F&E 60" 3-drum roll feed, dmd
Sanders, McKnight single drum 24"x16" dmd
Sander, W&M No. 171 belt bb, m.d.
Saws, Mattison No. 207, bb, dmd
Saws, Eaglesfield Swing cutoff, bb. dmd.
Saws, Eaglesfield str. line rip bb. dmd.
Saws, Beach double cutoff bb, d.m.d. 4x8
Saws, Hermance Gang Rip, pb & motor
Saws, New Delta-Crescent 12" tilting arbor dmd
Saws, New Multiplex
Saws, Porter C-43, cutoff, bb, dmd. & tables
Saws: Yates-Amer. G-7 str. line, bb, dmd
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Shapers: Whitney Auto. dbl.
Shaper, Whitney No. 389, double bb, dmd
Shapers, New Moak single spindle bb, dmd
Shapers, Greenlee No. 180 double bb, dmd
Shaper, Whitney double spindle, bb, dmd
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Disk Sander, 42 in., disk, M.D., $125
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Miter trimmer, bench type, $35
Molder, Smith, 7 in., 4 side $400
Mortiser, new ver. HC., $100
Mortiser, F&E Heavy, vertical auto. H.C. $250
Planers, Pony, 18 and 20 in., $175
Planer, Heavy 25 x 6 sgl., $250
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Saw, C M Co., tilt. table, Variety, $125
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Shaper, F&E 252 sgl, BB., $125
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Revolving Glue Clamp Carrier, Billstrom 29 sections, 200 Arms, Jaws 3⅛" High.

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Buss 26" direct drive, ball bearing planer, Model 4L with separate 4 speed feed mtr.

36" Tannewitz Bandsaw with hydraulic brakes, model G.I.E.

American 12" & 24" ball bearing Jointers, wedge bed machines.

Porter No. 666 Overhead Router 1½ H.P.

American Saw Mill direct drive, tilting arbor Saw, 3 H.P.

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High quality glued up furniture blanks in yellow Birch and rock Maple up to 7' in length and 30" in width.

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Diehl Chain feed Rip Saw No. 75 with 15 H.P. motor. In excellent cond. 6 yrs. old.
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1—NORTHFIELD—36" D.M.D. BALL BEARING BAND SAW 5 H.P. 220 Volt 60 Cycle 3 Phase 700 R.P.M. Motor on Lower Wheel. Carter Demountable Rim Type Wheels $1050.00

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Capacity 12"x18", Cross Cut, Like New
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WOODS No. 404-DM1—15" Motorized Planer and Matcher-Double Profiler.

WOODS No. 450-BM—30" Motorized Heavy Duty Double Planer.

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for rough and finish mill to take full charge of complete machine and assembly room. Employ about 30 men. Modern well-equipped plant in the vicinity of Boston. Manufacturer of high-class furniture. Only top production man who can take complete charge of production, planning, methods and control need apply. State fully all qualifications, personal data and salary required.

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Tensioning small round saws up to 36" dia. Secure job in Jackson, Miss. Give full details experience and salary wanted.

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Wheaton, Illinois

CHECK PULLEYS BEFORE INSTALLING REPLACEMENT V-BELTS

When multiple V-belts are replaced because of wear, belt engineers of the Thermoid Company, Trenton, N. J., advise that several points should be observed to obtain good service from the replacement belts. Normally the original belts are selected and, in some cases, installed by the original manufacturer in sets matched for equal length.

When the belts have served their expected life, the sheaves or pulleys will be from one-half to fully worn out, also. All too often, the new replacement belts are installed on badly and unevenly worn pulleys which will drastically reduce the life expectancy of the replacement belts.

The best practice is to replace the pulleys when the belts are replaced. In any case, the pulleys should be examined for roughness in the grooves which will cause excessive wear.

The grooves should be checked for uneven wear. The belts may be matched but not the grooves. To check for uneven groove wear, move the matched belts from groove to groove and test for difference in play. If uneven tension is observed, the pulleys should be replaced.

The replacement belts should be of the same type and construction as the original.

In order to assist belt users in obtaining matched sets, Thermoid belts are marked with symbols to show the variation from the nominal length. The marks range from about 38 to 62. A belt marked No. 50 is the nominal length. One marked No. 51 is .1" over nominal, No. 52 is .2" over nominal. No. 49 is .1" under nominal and so on.

Large belt users holding many belts in inventory should also be careful to use belts with approximately the same storage life under the same storage conditions to obtain matched sets as well as observing the match marks.

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Manufacturer of high-grade traditicnal and contemporary furniture, established 1890, has opening for a superintendent. Must have full knowledge of custom quality production including mill room, cabinet room, finishing, upholstering, and related phases of planning, scheduling, purchasing, cost control, and incentives. Salary range up to $9000 annually depending on experience and ability plus participation in long-established liberal profit-sharing plan.

c/o WOOD WORKING DIGEST
Wheaton, Ill.
Reply Box 343

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A Wood Kitchen Cabinet manufacturer—located in northern Illinois—Has an excellent opportunity for an experienced Production Man. Must be able to take full charge of a fifty man shop and be able to improve production efficiency through product design and methods.

State experience, availability, age and salary in your first reply.

Address Box 337
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Wheaton, Illinois

WANTED

Man to manage medium-size millwork shop in Eastern North Carolina. Must be capable of estimating, laying out work, and handling all shop details. Give full qualifications and salary in first letter.

address replies to Box 333,
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1—Used FCT-3500 Woodwelder or other equal machine with hand gun.

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Oliver No. 71 E 3 Spindle Horiz. Power Fd.
Root Single MD Vertical
Root Single Vertical MD, Motor Feed
Root No. 150 D 2 Spindle Horiz. Food Feed
Towsley 2 Spindle, 2" to 16" with Foot Tr.
Yates Amer. U31 Vert. DMD, 5 HP, 1 HP Fd

CLAMP CARRIERS

Black Bros. 39 Sections wide
Power revolving

COMPRESSORS

Ingersoll Rand, 10 HP
Westinghouse, 5 HP
Westinghouse, 10 HP

DOVETAILERS

Dodds 10, 15, 20 Spindle

GLUE SPREADERS

Black Bros. 22D44" Ruber Rolls
Black Bros. 22D38" Rubber Rolls
Wallace 52" Roller coater Rubber Roll

JOINTERS

American 12" Wedge Bed BB
American 16" Wedge Bed BB
Crescent 12" DMD
12" Colladay L. Powers, H. B. Smith, Crescent, Sidney
Newman 12", DMD, 5 HP, BB
Porter 12", BD
Northfield 12", DMD
Yates-American 16" DMD

LATHE

Oliver No. 25 Power cross feed DMD 4 sp head 24" swing 6 ft. centers

LOCK CORNER

Tidey 12", 3/16 cutters
Tidey 16", ¼ cutters

MORTISERS

Fay & Egan No. 510, Power Feed
Greenlee No. 228, Belt Drive
New Britain No. 2 and 7
Northfield Chisel Mortiser, Motor Driven
Sidney, Chain DMDM Power Feed R & P Table with DMDM chisel head.
Wallace Chisel Mortiser, Motor Driven

MOULDERS

Festo 2 spindle Self Feed
Mattison No. 229, 8", all elec., DMD, B.B.
Sherrill 6" MD BB
S A Woods 134M. 12", DMD., B.B.
Woods 6" all electric 132 m DMD

PLANERS

Monarch 20" CMD 5 HP with Starter, New
Northfield 24" Single, MD Motor Fd. No. 5
Triumph 4 side, 24" Planer & Matcher, B.B.
Whitney 24", CMD Sect. Feed, B.B.
Whitney No. 29, 40" CMD, BB
Whitney No. 29—36" Single CMD B.B.

ROUTERS

Ekstrom Carlson No. 156
Ekstrom Carlson No. 327
Onsrud Air
Onsrud 240
Porter No. 612

SANDERS

Beach Hand Block MD, 2 HP
Endless Bed Model S 3M
Mattison No. 431, 42", 3 drum, DMD, B.B.
Peerless 9", 14" and 20" Horiz. & Vertical
Solem 3 drum DMD 52" B.B.
H.B. Smith 404, 48", 3 dr. end. bed, cmd, bb
Vonnegut Vertical Drum Sander
Wysong & Miles, Oakley, Mattison Belt
Yates S-42, 30", 2 drum DMD, B.B.

SAWS - CUT OFF

Beach Double 100" travel 48" centers DMDM 7½ HP Motor Like New
Heston & Anderson No. 5. No. 25 & No. 55
Multiplex 5 HP DMD BB
Porter No. B43
Porter Hydra cut, 5 HP
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB

SAWS - BANDSAWS

36" American, Tannewitz, Crescent, Oliver
30" VB Drive Crescent
27" Crescent Band Saw
32" Crescent Guarded BB VBD
Northfield BB & DMD 20" to 36"
Tannewitz 42", DMD
Yates-American B36 Fully Guarded DMD

SAWS - RIP SAWS

Beach self feed gang Rip No. 182 A 10 HP
Diehl No. 750 Straight line 15 HP DMD
Tidey 48" Carriage
Tidey 30" Carriage & Boring Attachment

BAND RIP & BAND RESAWS

Yates No. 281 Band Rip

SAWS - VARIETY

Beach DMD 5 HP Tilt Arbor
Delta 5 HP Tilt Arbor
Northfield Tilt Arbor, DMD, 5 HP
Northfield Tilt Top DMD
Fay & Egan DMD Tilt Arbor, 5 HP
Pryibil No. 10 Tilt Top, BB All Alum. Gages
Tannewitz Type U 5 HP DMD 36" Rip. Cap.
Whitney DMD Tilt Arbor No. 77
50 other makes to choose from

SHAPERS

Advance Single Spindle, Clutch-Driver, BB
American (S30) Sgle. Spdl., 5 HP & 3 HP
Colladay SS BB, 5 HP
Porter, Single No. 203, 5 HP, Large Top
Whitney No. 34A Double
Yates-Amer., N44 Dble., 5 HP, Compl. encl.

TENONERS

Crescent Single end 5 heads DMD
Millbury Bench Model, 4 Hd.

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Corrugated Fastener Driver, Dois. "Mono-Fast", single head, 2 h.p.
Clamp, Handy No. 64, air-powered, sofa & Chair.
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End Matcher, Sherman Style "B".
Frequency changers, 40 K.W.; 77½ K.W.
Glue Jointer, ballb., F&E No. 429, 3 motors.
Hopper Feed, for 12" electric moulder.
Lathe, automatic, Imperial 30", ballb., 10 h.p.
Lock Corner Cutter, Morgan "Camera".
Lock Corner Cutter, double end, Luster-Jordan, ballb., full automatic, two 15 h.p. & one 5 h.p.
Moulder, ballb., 4-s., Smith 6", c.s.
Moulder, electro-unit drive, Dependable 8".
Moldmatcher, Smithway 4" XL, 3 motors.
Moldmatcher, Smithway 6" XL, 3 motors, No. 60.
Nailer, Morgan o.b. 90° clincher.
Nailer, Honeywell, 16-chucks, automatic.
Nailers, 9 & 6 tr., compression chucks.
Nailer-Clincher, Morgan 16-tr., 30", o.b., comp chks.
Planer, dbl., ballb., F&E No. 140-A, 30"x8".
Planer, dbl., Whitney No. 24, 30"x7", b.b., 4 mtrs.
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Planer, sgl., Buss No. 44, b.b., 36"x8", 4-kn. rd. heads, 20 h.p., 3600 rpm, 3 h.p. 4 spd., & ½ h.p. bed motors.
Planer, sgl., Sidney 24"x8", b.b., 5 h.p., 3000 rpm.
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Rip saw, chain-feed, Yates G-2, 7½ h.p.
Ripsaw, chain-feed, Yates-Am. No. 77, 2 motor.
Routers, Porter No. 600, 2 h.p., Onsrud W-240, 5 h.p.
Sander, 3-dr., e.b., Smith No. 505, 49", 4 motors.
Sander, 3-dr., e.b., Yates No. 431, 43", c.s.
Sander, sgl. drum, Y-A No. 411, 42" roll-feed.
Sander, edge belt, Yates S-2, 5 & 1 h.p. motors.
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Saw, c.o., Porter No. 43 SL, 5 h.p.
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Shapers, dbl. spdl., Whitney & Advance.
Shaper, single spindle, Onsrud No. 200, 5 h.p.
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American, Colladay, and Silver 36-in. M.D.

BORERS
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Root G300 Heavy Duty Hyd. Vertical, Single
Root "B" 14x25 Rect. Hood Vert. Multiple
Greenlee No. 369-D 6-ft. Vert. Multiple, M.D.
Greenlee No. 386-C 8-ft. Vert., 16-Spdl., M.D.
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Root K250 Horizontal, Multiple-Spindle
Root D210 Heavy-Duty Hyd. Horiz., Single

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Handy No. 50 Drawer and Cabinet Clamp
Handy No. 444 Two-Way Air Clamp
Handy & Union Air Revolving Case Clamps
Lancaster No. 1000 Air Chair Clamp

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Porter CM 16-in. Hand Jointer, Direct Motor-Dr.
Fay & Egan No. 429 Continuous-Feed Glue Jointer

LATHES
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MORTISERS
Wysong & Miles No. 284 P.F. Hollow Chisel
American No. 20 Auto. P.F. Hollow Chisel
New Britain No. 2 Chain Saw Mortiser, M.D.
Enterprise Ball-Bearing Pulley Mortiser, M.D.

MOULDERS
Mattison No. 229, 9-in. All-Electric, 4-Side
Y-A No. 26-A, 12-in, 4-Side, Motor-Driven

PLANERS
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Y-A B-8 30-in. Single, Ball Bearing, Direct M.D.

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Ekstrom-Carlson No. 126 high-speed Electric Router

SANDERS
Smith No. 404-D, 42-in. 3-drum End-Bed, B.B.
Heath 24-in. 2-drum Roll-Feed, Motor Driven
Wysong & Miles No. 275 Hand Block Belt Sander
Wysong & Miles No. 294 Auto. Stroke Sander
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Wysong & Miles No. 289 oscillating edge belt
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Root M207, 48-in. Single Disc Sander, M.D.

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Bell No. 12-B Double Miter and Cut-off Saw
Y-A No. 8 Tilt-Arbor, Roller Table, Motor-Driven

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Hermance No. 333 Chain-feed Rip, Direct M.D.
Mattisen No. 207 Chain-feed Rip, Direct M.D.
Greenlee No. 426 Self-feed Rip, Motor-Driven

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Porter No. 110 Double Spindle, Motor-Driven
Whitney Nos. 134 and 150 Double-Spindle, M.D.
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Hawker No. 2 Dowel Rod Machine, Motor-Driven
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Grupp 25-in. Hyd.-Feed Lock-Corner Machine

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Yates 36", Ballbearing, D.M.D.

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Yates 2-Spdl. Vert. Angle, D.M.D.
Superior 3 Spdl. Adj. Horiz. M.D.
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Tonk 24" Auto. Facer, DMD, BB
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Diehl No. 69 Cont. Fd Jointer, DMD
Dennis Taping Machine, Mtr. Dr.
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Yates-American A23 Elec. Hardwood Flooring Mach.
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Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw

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Onsrud WA-85 Automatic Shaper
Onsrud W-125 Double Spindle Automatic Shaper
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Dennis Veneer Taping Machine, Motor Driven
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Morgan 7-track Open Back Nailer with Clincher
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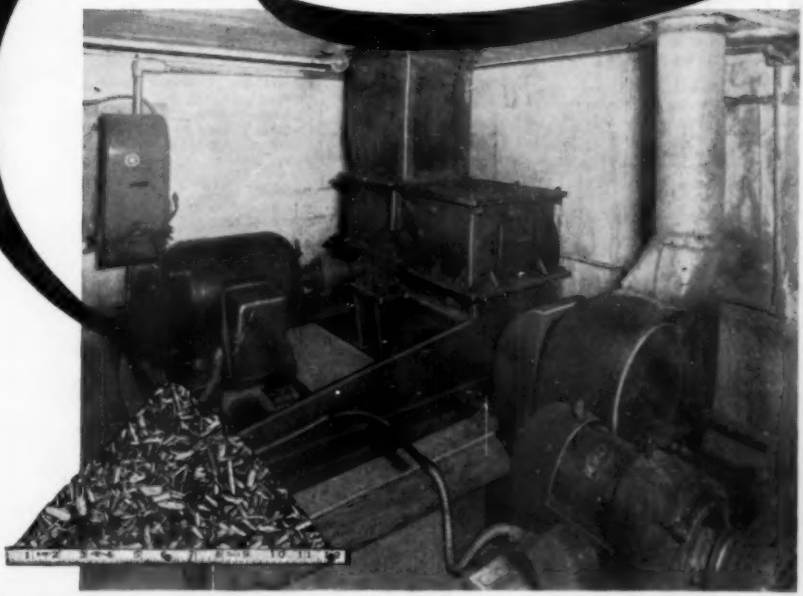

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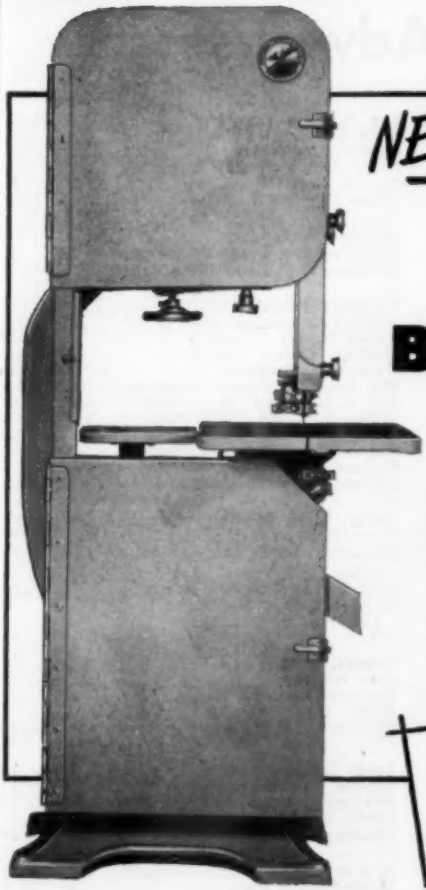

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- Wood Shapers
- Jointers
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- Mortisers (Chain & Hollow Chisel)

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We guarantee perfect satisfaction to anyone who may purchase our machines, and if any reasonable exceptions are taken to their good performance, they may be returned at our expense.

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are built to solve your production problems

MODEL BNFX tacks easily metal channels, masonite, weather-stripping, extremely hard case-backs in furniture, etc., with low carbon staples and you save money.

Used like a hammer the MODEL E tacker firing on contact allows terrific speed with little effort, reducing your biggest cost — TIME.

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Write . . .

Senco® PRODUCTS, INCORPORATED

5566 Wooster Pk. — Cincinnati 27, Ohio

Sales and service in all principal cities of U. S. A. and Canada

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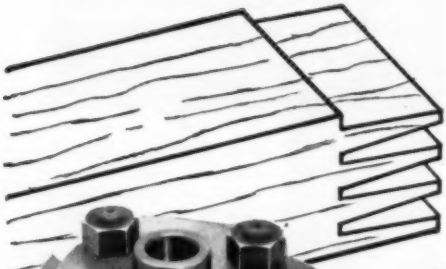
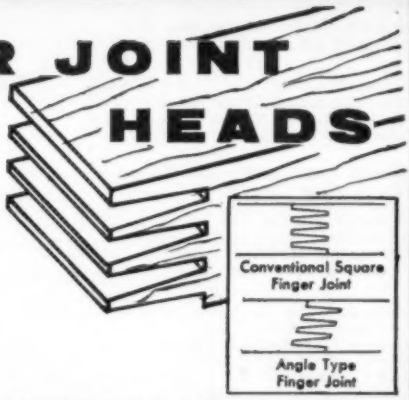
BADGER

FINGER JOINT HEADS





CONSERVE YOUR LUMBER SUPPLY BY converting random-length scrap into profit making stock with the aid of BADGER finger joint heads and cutters. Whether you have a combination finger-jointing assembly machine, single or double end tenoner or a shaper, we have a standard cutter to do the job.

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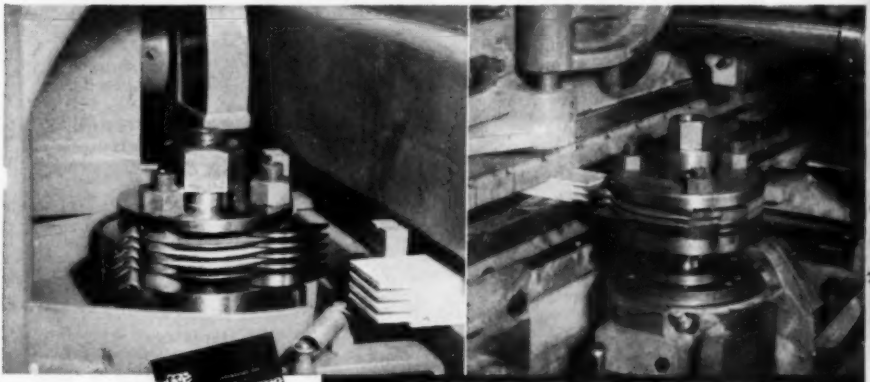
CONVENTIONAL SQUARE OR ANGLE TYPE finger joints can be made with the same basic cutterhead. Interchangeable cutters are made for either joint and for various thicknesses of material. Cutterheads, circular cutters and shaper cutters are carried IN STOCK for the square joint. Length of fingers can be varied to meet your requirements.



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BELOIT, WISCONSIN

Engineers to the Woodworking Industry!

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Harbor Furniture Mfg. Co. reports:

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RESULTS IMPROVED,

OUTPUT INCREASED

with Mattison Rip Saw and

Automatic Stroke Sander

"We are happy to recommend the Mattison 202 Straight-Line Rip Saw and 303 Stroke Sander without reservation," writes Harbor Mfg. Co., South Gate, Cal., after finding Mattison equipment "helpful in both quality and production."

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WOODWORKING MACHINERY

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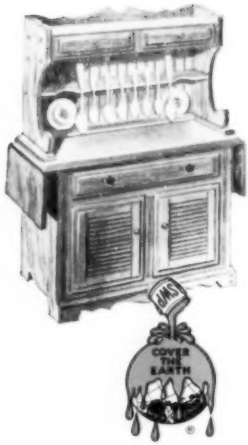
Custom-finish answers

from COLONIAL to MODERN

for B. P. John Furniture Corp. by Sherwin-Williams



The distinctive new furniture lines of B. P. John range from "Nantucket Colonial" in Salem maple, to "Tradewinds Modern" in hardwood and "Fireside Modern" in birch veneers. All are finished with custom materials from Sherwin-Williams in a multiple-step, carefully hand-rubbed and polished system to resist marring and stains.

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SHERWIN-WILLIAMS
INDUSTRIAL FINISHES

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